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FIRST LOOK! LOSI JR-X2

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Radio Control CAR ACTION

THE WORLD'S PREMIER R/C CAR MAGAZINE
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CLASH of the Titans: Double Dare VS. Clod Buster

BONUS: Monster Buyer's Guide

MONSTER MANIA

PROJECT Clod Buster

Double Dare

Quicksilver Puller

BREAKER ONE-NINE

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Volume 4, Number 4 April 1989

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EDITORIAL

by CHRIS CHIANELLI

Chianelli and Luna, scouting the waste-land for a site to run monster trucks.

BUYER BEWARE! Beware of toy-grade radio-controlled cars. You know the ones I'm talking about: the kind sold at department stores, discount chain stores and, of course, toy stores. I'm sure there are some good cars sold at these outlets, but I haven't seen or heard of one that has decent spare-parts support. But I *have* seen a lot of letters from readers who can't find parts for their department-store cars. Most of these letter writers relate stories of unsuccessful quests for a broken whatever, and are turning to us as a last resort. It seems that many of these cars are made and sold by firms that aren't in the service business.

And who, typically, falls prey to this quick-sale scene? Who else but the young beginner?—the kid who saves all his hard-earned money to buy the first R/C car he can afford. And the outcome is invariably the same: another soul forever turned off this hobby and the endless fun and excitement it's capable of delivering.

And then there's scene number two—the dry-cell story, which goes like this: The enthusiastic beginner buys a car that calls for dry cells to power it. He or she quickly finds that for speed and duration, alkaline batteries are in order. From here, the "blanks" wouldn't be difficult to fill in: Newcomers quickly find that it gets expensive when you continually have to shell out money for high-priced throwaway batteries, and disenchantment soon sets in. Sure, there are rechargeable AA batteries, but will beginners learn of them *before* getting disgusted and perhaps quitting? Or suppose the neophyte *does* buy rechargeable AA batteries and a charger; will they be of any use aboard a good hobby-grade car? NO! Some of these toy-grade cars might seem to be a great deal, but, as the axiom states: Buy cheap and you buy twice. The catch is that many can't, or won't, buy a second time, because of their first sour experience. So spread the word. The next time an uninformed potential enthusiast comes your way with questions, go out of your way to offer *sound* advice, because beginners keep the hobby vital.

It's here!! *RCCA's* second annual "Monster Truck Special," that is. We have "Clash of the Titans, Part I," "Return of the Blackfoot," "Makin' Trax," which features a tank crusher, and many more features devoted to those muddy mutants—the *monster trucks*.

Message from the Ayatollah of Radio Controlla: Bigger is better! ■

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LETTERS

WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

Roared Response

This is in regards to the "Publisher's Page" in the January issue of *R/C Car Action*. Publisher Louis DeFrancesco Jr., comes down pretty hard on ROAR because, as he states, "We get nothing but negative letters concerning the races and rules that ROAR is involved with."

I'm sure that if anybody only received *negative* input about something, they wouldn't speak too highly about it, so what Louis printed is understandable: It's all he's heard. I'm not about to say ROAR's perfect, any more than I'd say our government's perfect. ROAR isn't perfect, but it's continually getting bigger and better. It started when R/C cars started, and I firmly believe that it has been the single most important force guiding our sport over the last 20 years. Volunteer ROAR members have devoted countless hours to serving fellow racers, formulating rules and bylaws, sanctioning and officiating at races, etc. Each volunteer deserves a great deal of thanks from the rest of us.

I'd like to suggest to Louis that he continue to publish any negative letters about ROAR that he wants to, as that's his right as a publisher. However, as the publisher of the fantastic *R/C Car Action*, I think he also wants to do the right thing. I suggest ROAR should be given a chance to respond to negative letters *in the same issue*. So when the letter appears in the magazine, ROAR's response is also there. That way, we can all benefit from the discussion.

ROAR can use constructive criticism; that's what helps it to become better. But it also deserves the chance to defend itself. Isn't that the American way?

GENE HUSTING,
ROAR member

Gene, thank you for your comments. It's our policy to air both sides of any issue in Radio Control Car Action. The irony is that we've had no positive input *about ROAR, and the* negative *letters arrive with alarming regularity and in continually increasing numbers. As a student of the obvious, I can only surmise that*

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these letters are indicative of a serious problem with ROAR. Any organization is fallible, and if you were the recipient of so many negative comments, you, too, would draw the same conclusions. I'm sure ROAR has made some positive contributions over the years, but the hobby is in a state of dramatic growth and change, and what worked years ago is obviously inadequate now—it's no longer a "Mom & Pop" industry. It wasn't our intention to "indict" ROAR, but to have the voice of concerned modelers heard so that some changes for the better could be initiated. I believe that's *the American way!*

LVD

Sorry, You Lose

I just read about the new contest. Great idea! Anyway, I think I found your mistake in the Jan. '89 issue. It's on page 35 in "Project Javelin." Under a picture, you state that you have a Trinity No. 2002 Sprint motor, but later say it's really a Trinity Monster Horsepower No. 2002.

I was just reading the Thundershot Q.D. ad, and found a misprint. They described the radio that comes with the car as "super het"! I think they meant "hot." Keep up the good work.

RICK NETT
Fond du Lac, WI

Sorry, no cigar! But thanks for writing in and don't let my insensitivity discourage you in the future. The Monster Horsepower's part number is 2002. The term het is short for heterodyne. It appears in the Tamiya ad as "super het," but super heterodyne is the full term, which refers to the receiver design that has been used for many years in R/C airplanes.

CC

Ticked Off in Roanoke

In response to Mr. Provetti's letter: Advancing the timing on your motors is a good idea...*if* you're a *cheater!* I'm in 100-percent agreement with him. If you want to use a faster motor, buy a Team Losi Revolution motor and compete in Modified. People only stay in the Stock Class because they know that they can win more easily with these advanced-timing motors. The racers who advance their timing aren't giving everybody a

(Continued on page 10)

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LETTERS

fair chance, especially first-time racers and novice R/Cers. Everyone should have an equal chance at the checkered flag with his/her own car that has, of course, a truly stock motor. If you timing advancers are reading this: Stop it, or move to a different class of racing!

AN RCCA FAN
Roanoke, VA

Yeah, cut it out, you bunch of sneaky cheaters!! Thank you, to the anonymous fan in Roanoke,VA.

CC

Unsprung?

I wanted to comment on the Nov. '88 "Budget Racer" article by Dick Brinton. I find his articles, and all others in *RCCA*, most informative and enjoyable. However, in this case, I think one detail in the rear axle article requires some clarification.

The article is certainly correct, except for the component-weight comparison. The picture showing the Traxxas Cat rear suspension with a right(?)-side suspension from an RC10 should also include the left-side suspension of the RC10, since the Cat's suspension, by design, comprises both the left and the right sides.

The pictures of the suspension pieces on the weighing scales should also include left- and right-side RC10 pieces. This would bring the unsprung weight of the independent suspension up from 4 ounces to 8 ounces, compared to the 16 ounces of the solid-axle example. This is still a substantial difference. The unsprung weight of each suspension will also be increased by the weight of that part of the shock absorbers that's directly connected to the suspension, but that would be difficult to illustrate and wasn't really required for the article. Certainly, the most important equipment was included.

If we consider the effect of a bump on the solid-axle suspension, a bump on one wheel of a solidly hinged suspension such as that of a Grasshopper would indeed affect the other wheel, owing to design, and would include the unsprung weight of the whole rear suspension. If this example car had a pivoting rear suspension like the Hornet's, only a part of the unsprung weight would be involved, since the other wheel would still be on the ground supporting some of the weight. The unsprung weight of the independent-axle car is, indeed, separated side to side, so one side doesn't directly affect the other. Perhaps this was the point of Mr. Brinton's article? I wished only to compare unsprung total weight, which should be minimized.

The *RCCA* "Budget" articles, such as the "Budget Boomerang" story in the November issue and the "Budget Racer" series, are very informative. I'm glad to see that the "grass-roots" new racer is being so well supplied with information to increase the enjoyment of our hobby. Keep up the fine work!

T.J. MOORE
Thunder Bay, Ontario, Canada

T.J, I think you hit the nail on the head with the statement, "the unsprung weight of an independent-axle car is indeed separated side to side, so one side doesn't directly affect the other." Of course, in the real racing world, what happens on any one of the four corners of a car's suspension will affect the other three corners. Any suspension change or adjustment, front or rear, will be felt in overall handling. However, Dick was referring to the unsprung weight of a unit. *Each side of an independent rear suspension is considered to be a unit that's mechanically isolated from the three other corners of the car. The solid rear axle, like that on a Hornet, is also a single unit, i.e., both rear wheels are mechanically joined. No matter how small the movement on the left side, it's translated to the right side and, of course, the converse is also true.*

CC

Stock Solutions?

In response to Bryan A. Walker's letter in the February issue of *RCCA*, I'd like to offer another point of view. As a lifelong hobbyist, racer, ROAR member, and now ROAR Region 7 Director, I'll

(Continued on page 14)

PUBLISHER'S PAGE

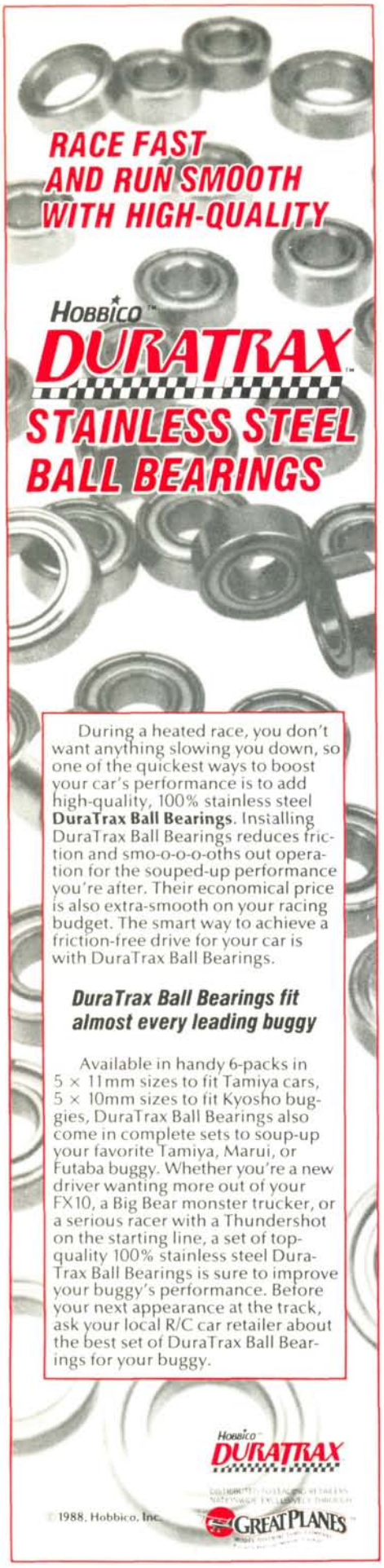
by LOUIS DeFRANCESCO

THE PACE AROUND HERE has been nothing short of frantic lately, with no letting up in sight—the reason being all the new books and special issues we're working on. Coming up shortly on the newsstand will be our second annual *Car Action Yearbook*. After that, our all-Monster Truck publication will be arriving, followed by more really informative publications that you'll be hearing about soon. You readers just can't get enough! I must say, however, all the complimentary letters we receive (especially the ones from modelers who tell us how immensely we've helped them) make our jobs so much more rewarding.

I'm sure you'll notice some of the graphic design changes in this month's issue. This is the result of our new electronic publishing system! We plan to bring Car Action right into the next century with state-of-the-art innovations like this.

We had a lot of fun with this particular issue, since it features many monster trucks—probably one of the largest segments of our hobby. I went out on a few of the shoots with Steve Pond and Commander Chianelli, and we came back with some dynamite photography. Who said this job wasn't any fun!? The only problem in going on shoots with those two characters is that they don't want to come back to the office: They only want to run the R/C trucks!

The letters are still pouring in about the stock motor controversy, and we love it. It seems there are thousands of concerned modelers out there who refuse to have their favorite hobby jeopardized by a handful of shortsighted individuals. Our hats are off to you. ■



LETTERS

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offer the thoughts of racers in the Pacific Northwest.

Bryan, I agree with your thoughts regarding stock motors. I think that unless we (i.e, the club racers who make up 95 percent of ROAR) put some meat in the rules, the Stock Class is dead, and that's *wrong!* We're headed toward the same "cubic dollar" mentality that killed slot-car racing: Whoever has the most money will win. That's *not*, nor should it be, the stated mission of ROAR. If we keep new people from joining us in our hobby, the hobby will certainly stagnate and die.

I, however, draw the line at blaming the mess on the racers themselves. Because there's no "timing" clause in ROAR rules, the motor manufacturers (who, not surprisingly, make up the motor-rules committee) started putting out increasingly "cranked" motors. Well, the racing public responded by buying what's available and "legal." For the most part, we all race because we want to win and compete. The truth is now starting to sink in: To win, you must pay the price, which, to me, defeats the purpose of a "Stock" class. When, (not if) the stock motors are "de-tuned," racers will not only be thankful, but won't even notice the difference. Speed is relative, gang! The stock class is supposed to teach driving skills and sportsmanship, not how to spend dollars.

As Bryan stated, you won't spend money on "stock" motors, when, for the price of two or three stock motors, you can buy a modified motor that will last five to six times longer and can be rebuilt for $20. I agree with you. But we run into a small, but growing, problem: People who shouldn't be racing in Modified are now forced to compete in a class in which they shouldn't be competing.

While the motor manufacturers may make a short-term profit on these cranked motors, people will soon stop buying them because of all the reasons you've stated. What then? Is that what it will take to force the motor makers to de-tune motors? Maybe it's time for a super-stock class, where the "cranked motors" can fit in.

In response to your comments regarding modifying stock cars, the weight and dimension rules cover these areas. No matter what "latest and greatest" a person has on his car, he still has to meet minimum weights. And cars can be brought to these minimum weights without buying all the trick "stuff." It just takes some work and tinkering, and that's what the hobby is all about. Take the motors and batteries out of the picture, and look at Cliff Letts's winning RC10. You'll notice very few super-duper trick mods! His *driving* won! I'm sure Cliff would have won even if he'd used closed end-bell stock motors.

The stock motor issue is almost out of control in the Northwest, and the response I get from Eric Gudger, the new ROAR president, and John Thawley, the ROAR administrator, is, "These are the motors the racers want." I disagree, and when I ask ROAR to put a ballot in rev-up, my plea falls on deaf ears. I challenge *RCCA* to put a ballot in the next issue of the magazine. Ask the people who read your magazine if they want to keep buying and replacing these cranked stock motors, or should the rules reflect what the majority wants?: timing set at 10 to 15 degrees; pinned commutators (can't be tweaked).

In region 7, one track has put an rpm limit on motors, and when a Main has been run, motors are checked and, if found to be running too fast (23,000 max) the drivers are disqualified. I know that some will scream that these new motors will turn that, and that's the whole point: At these super rpm, the motor bushings burn up, and since they're ruined, you have to buy a new motor. If your motor runs higher than this, the track suggests you run that motor at a different track.

Rules mean squat if the racers truly do want these hot motors. If they don't, then let's change the rules, and if the organization doesn't want to change the rules, let's start a new organization.

As a service to the hobby and to racers, I hope *RCCA* will, at least, consider

(Continued on page 16)

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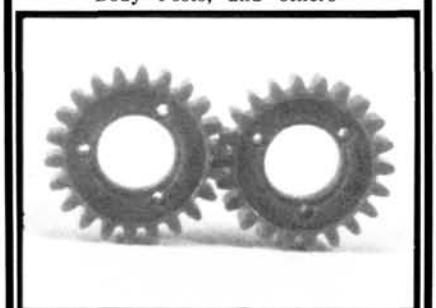

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LETTERS

(Continued from page 14)

taking a vote on stock motors. We need someone to take a lead role in this, and *RCCA* is the most widely read source of information.

STEPHEN S. WARNER
Spokane, WA

The "stock problem" has incited many readers to write in, mostly with moans and complaints. Here are a few of the suggestions some readers had to offer. We at RCCA invite rebuttals from everyone who takes issue with anything in any of these letters.

Regarding Mr. Walkers' letter about the Stock racing class: Has anyone thought of dividing the stock class itself? This would allow new enthusiasts, children, or those who wish to conserve their funds, to compete in the Stock class without an enormous cash outlay.

Here's what I mean: Class 'A' stock would allow any type of suspension, frame, drive train, etc., modifications (with the exception of 7-cell battery packs) and modified motors. (SCRs allowed).

Class 'B' Stock would restrict a racer to building his car according to the instructions—with *no* modifications. The racer must use a 6-cell SC pack and a relatively inexpensive stock motor agreeable to almost everyone, i.e., an RS540S.

I compete in the 2WD Stock class, and enjoy being creative with my modifications, e.g., reducing unsprung weight, trying different motors, batteries, gear ratios, etc. While these don't infringe on the Stock Class limitations, some people can't, or don't want to, make the investment necessary to try different modifications, so there's a need for regulation.

I think the above plan is a viable option that would aid racers without offending the manufacturers of all those "essential" after-market parts! Something to consider?

JOHN D.PLUMB
St. Louis, MO

In reference to the comment made by Bryan Walker: I think he has a point. It would be a good idea to use the Mabuchi RS540S in Stock-Class racing, but also keep the open end-bell motors with limited timing advancement as a separate class.

JOSH DALRYMPLE
Milford, OH

I appreciate the fact that you and your readers have brought to light an issue that few would otherwise dare to approach. It's for this reason and many others that I've switched to your magazine.

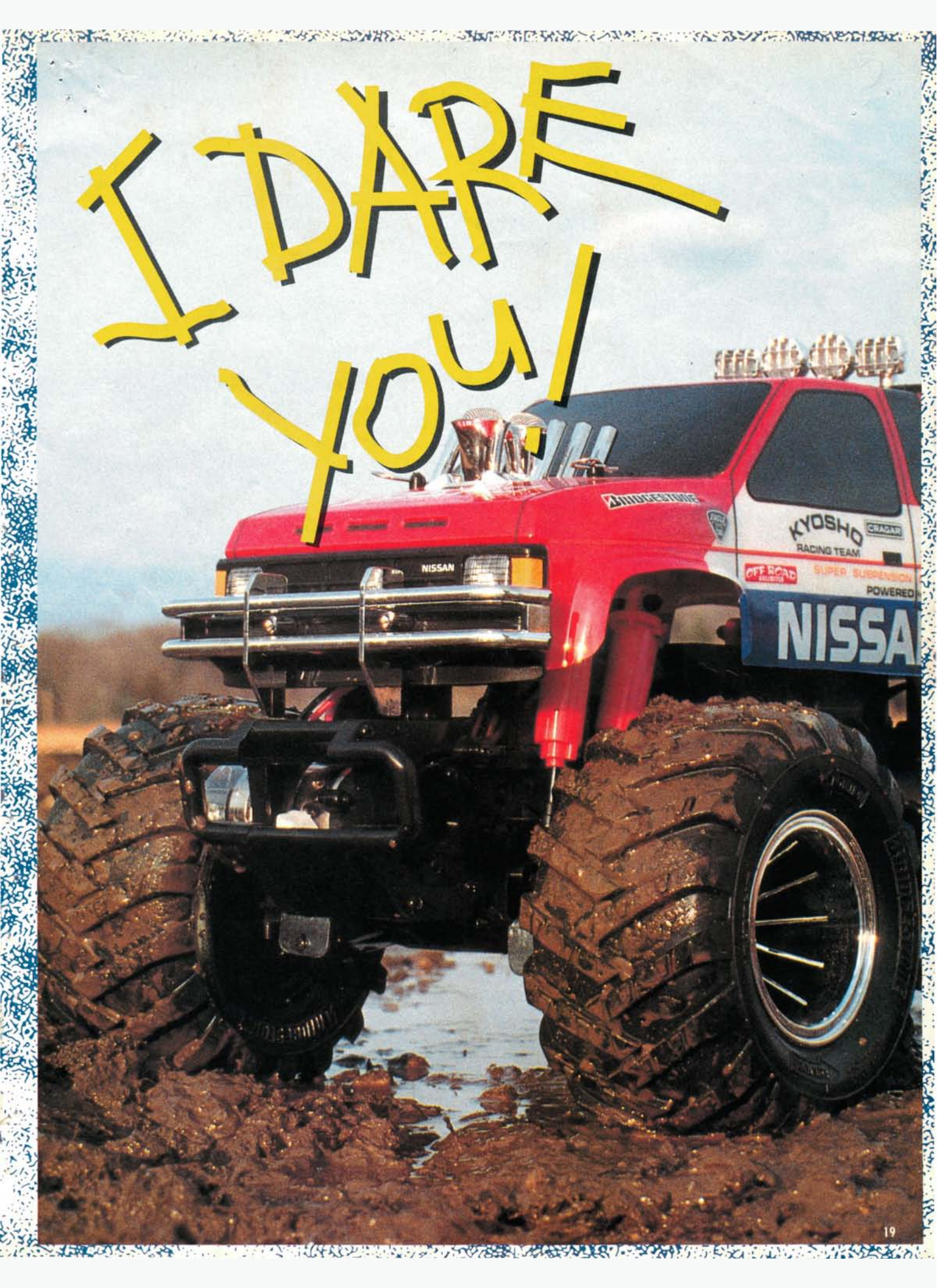
With respect to the majority of your readers' and Mr. Provetti's outlooks on stock racing, I'm in total agreement. Instead of complaining, however, I offer a solution—one that would add another dimension to racing without intimidating the rising novice. Why not try a new class? "Superstock," to be exact. These "stock" motors with advanced timing and various other qualities have no business being in regular stock racing, but rather than banning them altogether, they could feasibly be put in a class of their own.

"Superstock" class would keep any overkill trophy monger out of the Stock Class to allow rising novices (who are the future of our hobby) to race in a set and truly competitive Stock Class. The introduction of the Superstock Class would benefit both manufacturers and racers, by adding a new, interesting aspect to this fantastic hobby. I'd also appreciate Mr. Provetti's and the readers' opinion on this proposition. Racers, manufacturers and magazines like yours make this a fascinating hobby; let's not ruin a great thing.

BRET STEVENSON
West Germany

(Continued on page 75)

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, due to the tremendous number of letters we receive, we cannot respond to every one.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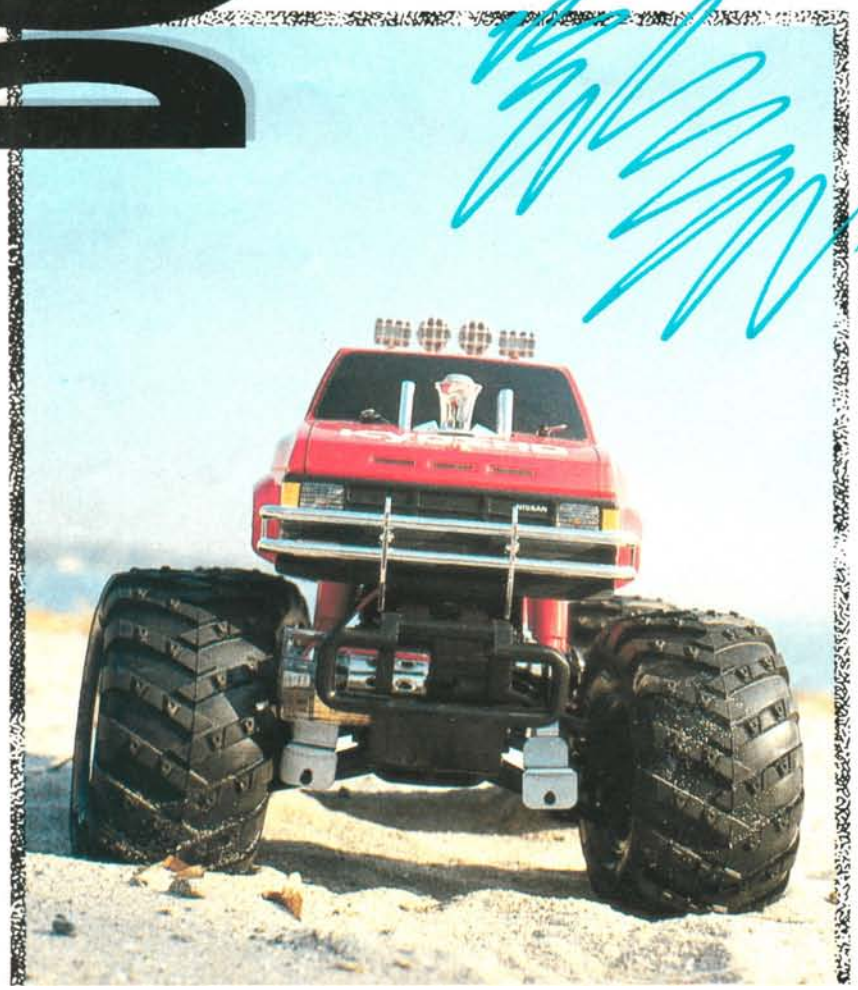
KYOSHO DOUBLE DARE

by JOE BRUNI

IF YOU'RE A MUD-BOGGING MANIAC, you've probably been awaiting the arrival of the Double Dare, the newest 1/10-scale monster truck from those innovative minds at Kyosho's* truck division. This late-model, scale Nissan pickup has *twice* the power of most trucks, with two Kyosho LeMans 05 motors connected to a 4WS/4WD setup. This is a monster that even the evil Dr. Frankenstein would be proud of!

The Double Dare is packed in a sturdy, colorful box that has an actual photograph of a completed model on its cover. As soon as you open the box, you'll notice an array of meticulously packed parts, which are letter-coded to expedite assembly. The 16-page assembly manual provides plenty of information, including a list of all required tools, easy-to-follow sequential assembly steps utilizing accurate, exploded-view drawings, and a parts legend for each step. The footnotes provide information that will help you to enhance performance and point out trouble spots you may encounter during assembly. Finally, an adjustment guide is also included to help you dial-in your Double Dare for maximum performance.



PHOTOS BY LOUIS V. DEFRANCESCO, JR.

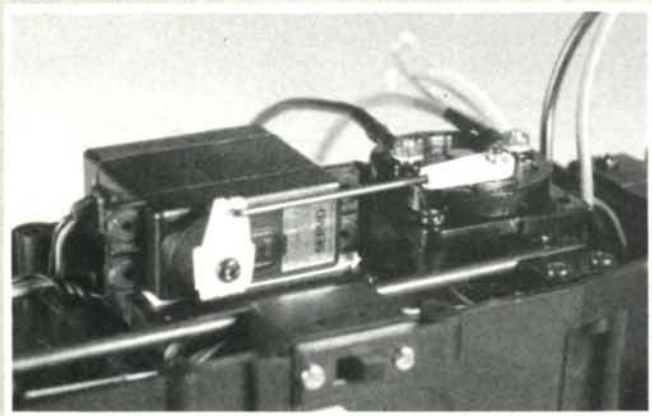
When I reviewed the Double Dare's list of features, it was obvious to me that Kyosho did its homework to engineer such a fine piece of machinery. From the ground up, this monster was made to endure whatever foolish obstacle that dares to cross its path. The chassis tub is a one-piece design of thick, lightweight, injected-molded ABS plastic, complemented both front and rear by two identical dust-free gear assemblies. In order to ensure a solid flotation ride over any type of terrain, Kyosho has incorporated a heavy-duty, dual-shock system on each wheel. The 4WD power is delivered to the ground through four oversize, Bridgestone monster "mudder" tires. To separate the Double Dare from other monster trucks, Kyosho has included heavy-duty half shafts, axles, tie rods and rod ends, as well as its new, rotary, mechanical speed controller that features silver contacts.

KYOSHO'S TWIN-MOTOR MONSTER!

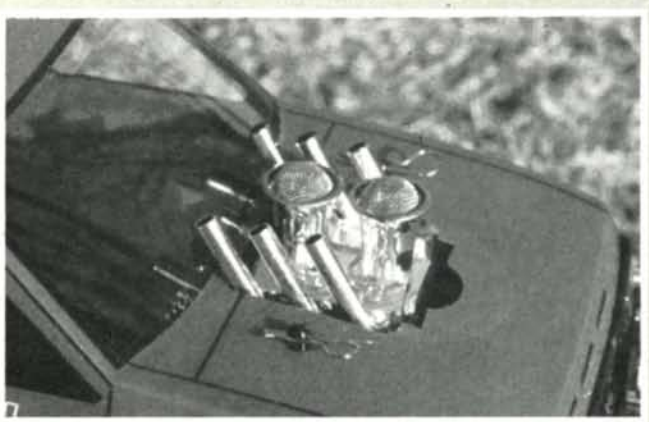
The Nissan body is a durable, clear, polycarbonate shell with an abundance of chrome parts and roll bar. The only option used on my test truck was a full set of Kyosho ball bearings—a must for those seeking maximum performance and extended running time.

ASSEMBLY: The gear assembly occupies the first two of the 19 construction steps. When assembling the gears, be sure to pack them with a generous amount of gear grease as mentioned in the manual. This simple step is essential, as it not only ensures a smooth meshing of the gears, but it will also extend the running time by decreasing the energy draw from the battery pack. After matching the two front gearbox halves, you've completed one assembly. Now simply repeat the same procedure for the rear assembly.

The next three steps deal with assembling the four suspension arms and attaching them to the main chassis. Let-

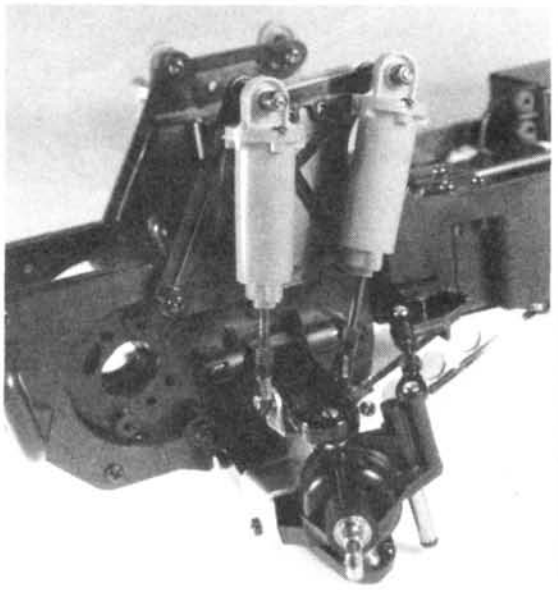


A Pulsar KS-88 is connected to Kyosho's new heavy-duty speed controller—a very reliable unit, even with two motors running off it.



A detailed, chromed engine pops through the hood on the Double Dare. It adds a nice touch to the truck.

ters stamped onto each of the suspension arms offer the builder an easy step-by-step sequence of construction. After assembling the four suspension units, construct the main chassis by connecting the front and rear gearboxes and then the suspension arms. The Double Dare requires a 2-channel radio, and although I chose the Kyosho Pulsar Pro-2000 pistol-grip radio system for this report, any standard 2-channel radio system can be utilized, as Kyosho provides all the necessary hardware to accompany almost any size of servos. After mounting the servo saver (provided) onto the steering servo and mounting the speed-control servo, install both servos into the main chassis.



Dual non-adjustable shocks are used on each corner of the chassis, and this works well for general handling and for jumps.

As mentioned above, Kyosho has designed a double-shock system that's integrated to each wheel. One of the dual-shock pairs has a stiff spring-load built right in, while the other shock only has a damper unit, thus creating one active shock and one dampening shock. Shock assembly and installation are followed by motor installation. The LeMans 05 motors are identified with gold and silver labels to help you distinguish between the front and rear. The motors are connected to a common harness, which is then connected to the speed controller. This common connection ensures equal power to both motors for balanced speed and control. The chassis tub is covered with a durable ABS plastic cover to help keep out the dirt. Assembly is completed by mounting the four 2.8x5.7-inch-diameter tires to the chromed monster wheels. Kyosho includes a full decal sheet that enables you to choose a wide variety of color and graphic designs.

The Double Dare requires a 6-cell battery pack, and there are several brands and types that will meet its needs. Kyosho has introduced two racing packs worthy of mention: the 7.2V 1200mAh Sprint SCR(red) pack and the 7.2V 1700mAh Speed SCE (yellow) pack. The Sprint pack is better suited to shorter events, as it's designed to put out maximum voltage in a shorter time; the Speed pack lasts longer and provides output over a longer time. For my initial runs, I chose the Sprint pack for quicker acceleration. To get maximum output from the battery pack, I charged the packs on the new Model Craft* Pro-Tech 700 AC/DC charger. The charger features a LCD volt/amp meter, three charge cords, adjustable current, automatic trickle-charging and more. Simply hook up your battery pack, adjust the timer and presto—you're charging!

PERFORMANCE: What better conditions to test the Dare than the day after my favorite 1/10-scale wasteland had been assaulted by a heavy rainfall—lots of muck! After placing the battery pack in the convenient battery door, I was ready for the shake-down run. Without hesitation, I buried the trigger, and the monster mudders spit up dirt in all directions as the truck sped away. This is one of the fastest 1/10-scale trucks I've run. Taking advantage of the quick burst

KYOSHO

DOUBLE DARE

Type ..... Monster truck
Scale 1/10
Sug. Retail Price $219.95

DIMENSIONS:
Overall Length ..... 17.5 inches
Width ..... 11.5 inches
Height ..... 11.25 inches
Wheelbase ..... 10.25 inches
Front Track ..... 8.5 inches
Rear Track ..... 8.5 inches

WEIGHT:
Gross (w/bat.) .... 6 pounds, 12 ounces

BODY:
Type ..... Nissan hard-body pickup
Material ..... Polycarbonate

CHASSIS:
Type ..... Tub
Material ..... ABS resin

DRIVE TRAIN:
Differential ..... Geared
Bushings ..... Plastic (standard)

SUSPENSION:
Type(f/r) ..... Upper & lower arms
Dampening (f/r) .... Twin friction shocks

WHEELS:
Type (f/r) ..... Chrome plastic mags
Dimensions(DxW) (f/r) ..... 2.875x 2.4375 inches

TIRES:
Front ..... Terra (5.5x2.875 inches)
Rear ..... Terra (5.5x2.875 inches)

ELECTRICS:
Motor ..... Two stock LeMans 05s
Battery Type Required ..7.2 flat pack
Speed Controller ..... Kyosho silver contact enclosed rotary

OPTIONS AS TESTED:
Full ball bearings, Pulsar Pro 2000 radio.

COMMENTS:
The Double Dare is a good truck at a fair price. The chassis and suspension are strong, with the exception of the steering arms, which broke.

Plastic bushings have no place in an R/C car—especially a Monster Truck. Almost all manufacturers are guilty of including plastic bushings, which we'd like to see replaced with, at least, oil-lite-type bronze bushings.

INSIDE SCOOP

by CHRIS CHIANELLI

The R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!

SUPER SCOOP

These handmade earth-moving models feature 5hp water-cooled ignition engines with electrically pumped hydraulics. No, you can't *buy* these anywhere, but motivated scratch-builders will, no doubt, be inspired. The builder/owner allegedly does his gardening and lawn chores from the comfort of his shady porch, with lemonade handy at all times!

ROBO RALLY

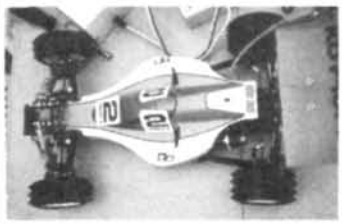
Lady Lingafoon (our spy in the Orient) has uncovered this Toyota Celica GT Four and Peugeot 205 Turbo 16 Rally car from Hirobo. Both are shaft-driven, 4WD and powered by an inline-mounted 540. No word yet on availability.

OPTIMA STRETCH

Kyosho allegedly has an Optima with a wheelbase that's been stretched by 18mm. I've been told the name of this new car is the Optima Custom, and the Optima Custom Sp. is the version with all the goodies, like ball bearings. I think they should call it the Optima Mid Turbo Stretch SE Sp.... Custom.

1/8-SCALE ELECTRIC!

That's right! Rumor has it that the people at C&M, who bring you the competitive 1/10-scale Cobra, are laying the groundwork for an electric-powered 1/8-scale road racer. The car is only slightly heavier than a 1/10-scale car, and it's reportedly easier to drive, owing to its predictably smoother handling characteristics, which are inherent to larger cars.



AVAN-QUISH

Straight from a race pit in Japan, here's a shot of Tamiya's new Vanquish. The Vanquish is obviously very Avante-esque, having more plastic suspension components and more conventional adjustable upper links. I hope the Vanquish has been designed with more travel in the front suspension than there is in the Avante.

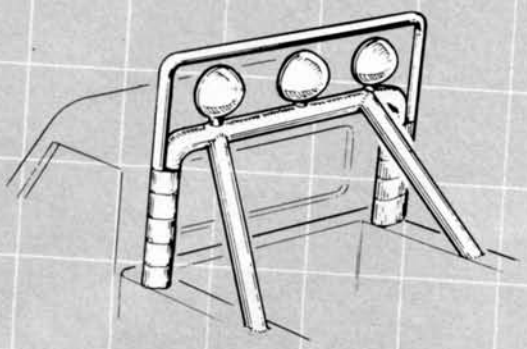
NIKKO SUPER SPRINT

Once again, our beautiful overseas correspondent has brought us some interesting information. It seems that Nikko has produced a 4WD off-roader that has been holding its own in Singapore and Japan against such adversaries as Kyosho, Yokomo and Tamiya. The Super Sprint features: micro-lathe, precision, aluminum-alloy oil shocks; UP240SE high-speed motor; front and rear anti-sway bars; "long-stroke" double-wishbone suspension; belt-drive with adjustable torque splitter; and front and rear gear diffs. No wonder this car is successful on the race circuit. It's a shame the distributor in the U.S. is keeping it such a secret from us at *RCCA*.

Keeping the industry BUGGED, I'll see you next time–or sooner, if I catch you in my spyglass! CC

PIT TIPS

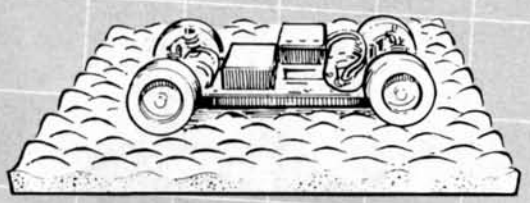
by JIM NEWMAN



LIGHT PROTECTION—1

Rick loves those lights on the Blackfoot monster trucks, but he noticed that most seem to break off when the trucks roll over. To keep his Blackfoot lights in pristine condition, he extended his roll bar to above the lights by using a piece of hefty coat-hanger wire taped to the roll-bar uprights. To date, he says his lights are unscathed.

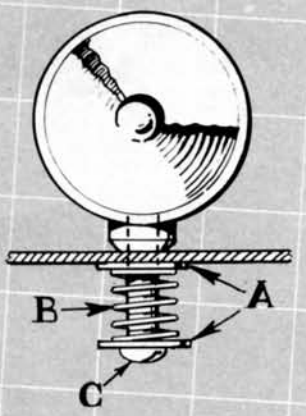
Rick Holguin, Salinas, CA



WORK PAD

A square of foam-rubber carpet underlay placed beneath your car during assembly or repair will prevent scratches, and it will catch and retain those dropped screws, clips and washers, etc.

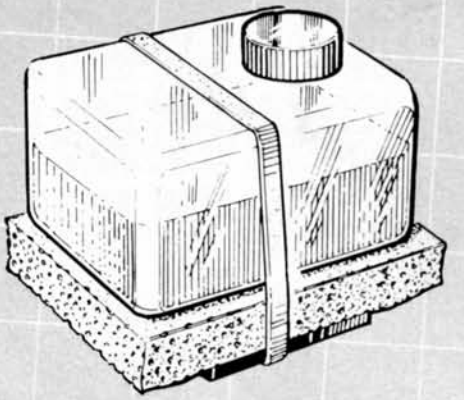
Bernie Heringhaus, Ottawa, OH



LIGHT PROTECTION—2

Brad says that this is his way of mounting decorative lights on Lexan car bodies, but it struck me as a useful method of mounting lights so that they "give" on roll-over instead of snapping off. The hood ornaments on most cars are mounted this way, too. "A" is a washer; "B" is half of a ball-point-pen spring, and "C" is a thread-cutting screw. Tighten the screw to compress the spring about 1/8 inch.

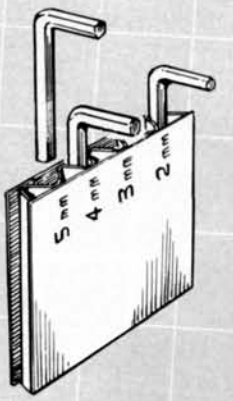
Brad Bates, Trafford, PA



FUEL-FOAMING TIP

If the fuel tank is rigidly mounted in a gas-powered car, the fuel will foam when subjected to engine vibration, and this leads to feed problems, lean runs, etc. The cure is well-known in R/C flying circles: Set the tank on a 3/4-inch-thick sponge-rubber pad to isolate it from vibration, and secure it with a rubber band. Make sure that the rubber band doesn't compress the foam and so prevent it from doing its job. Genuine sponge rubber is available from Carl Goldberg Models and ACE RC.

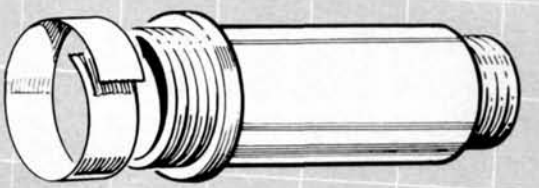
Nate Estep, Oakland, CA



KEY HOLDER

Here's a simple, convenient method of storing small Allen keys. Tape a small, rectangular piece of corrugated cardboard inside the pit kit, put a key into each corrugated flute, and, for easy location, paint each key bright yellow.

Jeff Tham, Nashville, TN



SHOCK-LEAK FIX

Gregg claims to have stopped all shock leaks on his Ninja. After servicing, but before reassembly, he winds one layer of Teflon pipe-sealing tape (from hardware stores) around the threads as shown. Notice the direction of overlap, so that when you screw the cap back on, you don't unwrap the tape.

Gregg Green, Littleton, CO

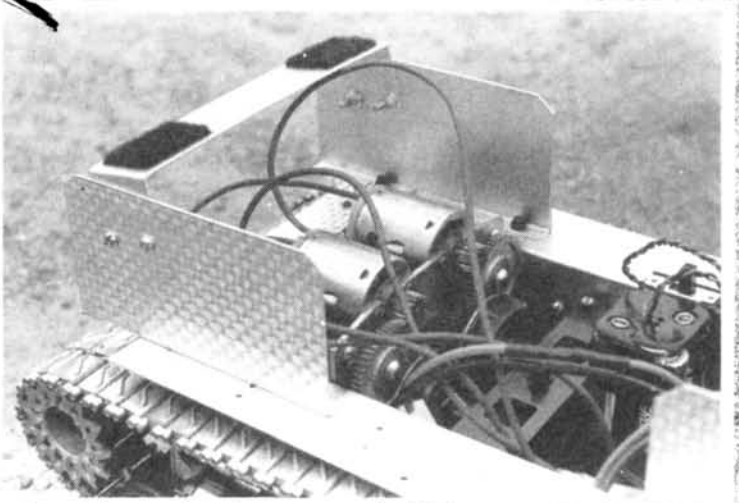
For more Pit Tips, see page 30

MAKIN' TRAX

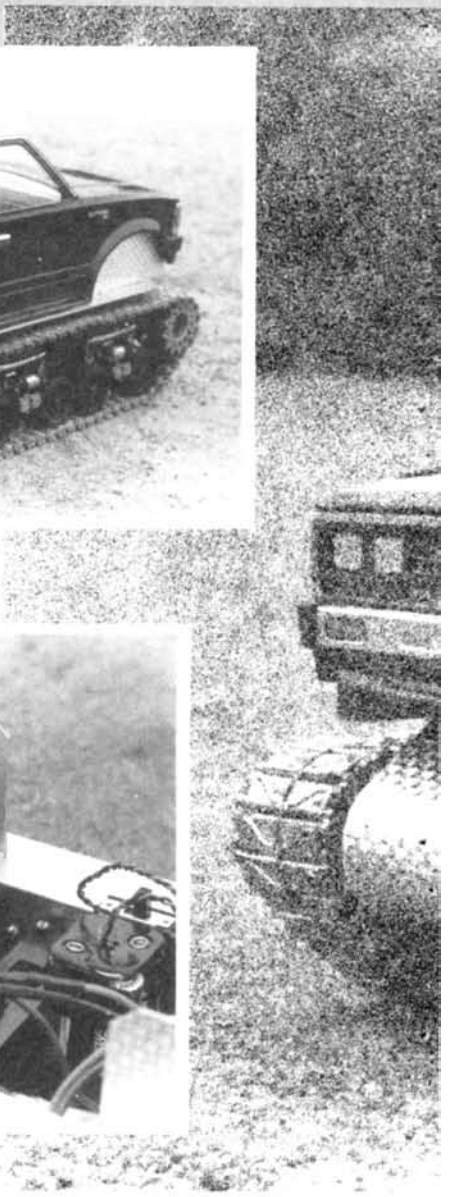
by DAVE SPROUL

ALL ACROSS AMERICA, thousands congregate in arenas and coliseums to witness what has to be the most phenomenal motor sport of all time—Monster Truck Racing! Who would have thought that a blue Ford pickup truck with oversized tires and the name of Big Foot would spawn such a craze? In the last few years, many monster trucks have been built, and more than 200 are running today. The popularity of these monsters is shown by the manufacture of R/C trucks, such as Blackfoot, Big Brute and Clod Buster. Now, for a fraction of the cost of a full-size brute, you R/C fanatics can own and drive your own monster trucks.

Above: The 1/12-scale Big Bear Datsun pickup body rides high above the Tamiya tank tracks.



Above: These stock tank motors are scheduled to be replaced by a pair of 05 modifieds. That should lead to even faster crushing.



Above: Car crushing is the obvious reason for building this R/C monster tank truck.

However, R/C manufacturers have yet to create a scaled-down version of the latest monster craze—monster *tanks!* These machines feature a truck body fitted to a military-tracked vehicle chassis equipped with modern horsepower, and they're controlled by two levers instead of a steering wheel. With this in mind, River Junction Train and Hobby* built its own R/C monster tank called Makin' Trax; it's an operating 1/12-scale R/C Datsun Monster Tank.

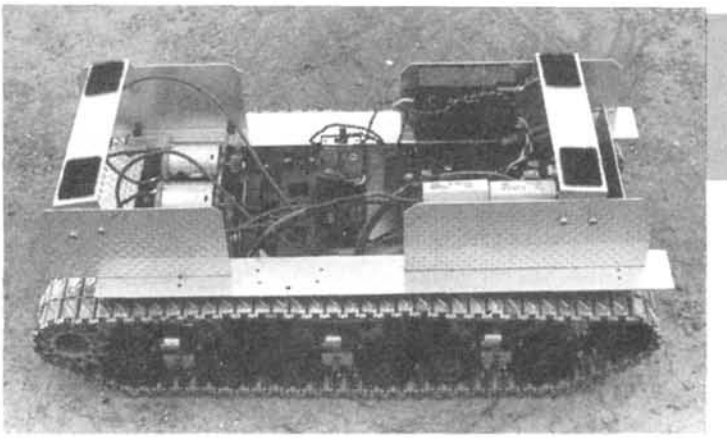
Beginning with an old 1/16-scale Tamiya* Sherman tank chassis, the following modifications were made: By installing two Tamiya Hornet speed controllers, twin 6-cell battery packs and a Futaba* 4-channel radio, the electrical system was updated to current R/C truck standards. The tank has two motors, each independently driving a track, and it can be steered by separately adjusting the throttle to each track. The chassis was fitted with a custom front skid plate, and, for a "turned" look, it was covered with silver iridescent foil. Wheel-opening filler plates and body-mount brackets were made of aluminum, and Velcro was used to secure the body to the tank.

A Marui* Big Bear Datsun body was selected, because it fit the chassis perfectly. The body was sprayed with a gold metallic base coat and topped with Testor's* Candy Grape over their Metallic Burgundy. Body detail was added, using Testor's paint and Bare Metal Foil. After simulating crushed velour with gray primer paint, a full interior was installed.

The stock Sherman tank motors don't perform as well as the current R/C truck motors, and plans call for their replacement by a pair of modified 05 motors. The addition of dual electronic speed controllers is also being considered. Look for some realistic car-crushing action as the performance level of Makin' Trax increases! New body detail and lettering are also being planned. (Perhaps I'll write a follow-up article.) Meanwhile, River Junction is planning another R/C monster tank project with a more up-to-date tank chassis.

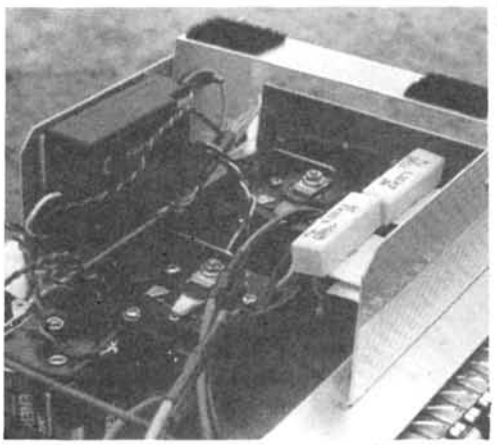
Since full-size monster tanks like Virginia Beach Beast, Car Crusher and Son of Goliath are now so popular, perhaps we'll see scale R/C kit versions in the near future. I hope so!

**Here are the names of the companies mentioned in this article:*
River Junction Train & Hobby, *570 3rd St., Beaver, PA 15009.*



Above: All signs of olive drab have been replaced, as the chassis was turned into a monster truck. Even with twin motors, there's lots of room for radio gear.

PHOTOS BY DAVE SPROUL



While the dual Hornet speed controllers get the job done, plans are underway to go state-of-the-art with electronic speed controls.

MRC/Tamiya, *200 Carter Dr., P.O. Box 267, Edison, NJ 08818.*
Futaba Industries, *555 W. Victoria St., Compton, CA 90220.*
Marui; *distributed by Model Expo, Inc., 23 Just Rd., Fairfield, NJ 07007.*
Testor Corp., *620 Buckbee St., Rockford, IL 61101.* ■

HEAVY ARTILLERY

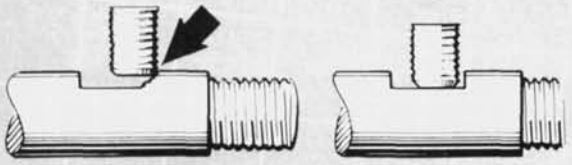
WANT TO BUILD your own tank-tracked monster truck? Well, MRC/Tamiya gives you three kit options: a WW II German Tiger tank and West German Leopard and Gepard tanks. As well as being the most formidable tank of its time, the 1944 Tiger Tank also had a wheel configuration that was very much like the ones found on today's full-scale treaded monster trucks. That isn't surprising, since most of these full-scale conversions are built out of other WW II tanks, like the Sherman Tank.

The nice part is that these 1/16-scale Tamiya tanks have some internals that are very familiar to R/C monster truck freaks, e.g., 540-size motors and coil-wound speed controllers. These tanks operate on any 7.2V battery pack and, with the factory-assembled twin clutch-drive unit, only a 2-channel radio is required for fully independent forward and reverse on each tread. This setup enables the vehicle to turn gradually by engaging only one tread, or gives it turn-on-a-dime capability by engaging one tread in forward and one tread in reverse. The road wheels (the ones lowest on the tank) are all independently suspended, and this makes the Tiger look very realistic while it's running. The treads are made of metal and plastic. Of course, the model can be kept as a tank, and two more channels can be added for rotating the turret and flashing gun.

But if you want to put a smile on your face and a frown of fear on your opponent's, there's no scarier monster than one that mixes mud and metal. So sorry, Field Marshal! ■

PIT TIPS

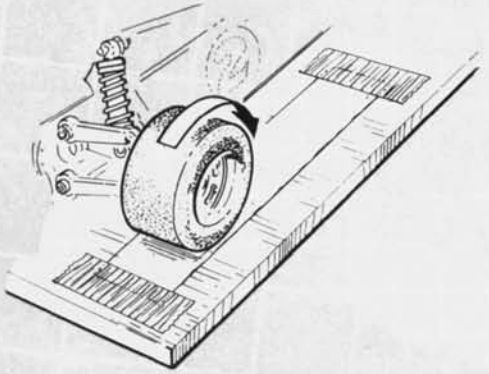
by JIM NEWMAN



IMPROVED WHEEL SECURITY

Mohammed found that his Toyota Toms and his Road Wizard occasionally shed their wheels. The setscrews weren't "bottoming" on the axle flat, because the slot was actually off-center, so the screws stopped on the corner, as shown by the arrows. The cure was to carefully widen the slot using a fine file. This correction, which should apply to other cars also, now allows the screws to "bottom" and tighten firmly onto the flat as in the sketch on the right.

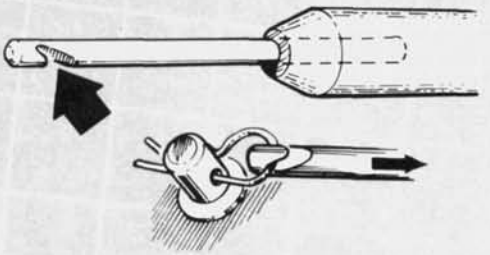
Mohammed Sheeth, Singapore



TIRE CLEANING

This is an effective way to clean the dirt and grit out of those "slicks." With the sticky side facing upward, tape a piece of duct tape to the bench and roll each wheel along it, keeping the tire firmly pressed to the tape.

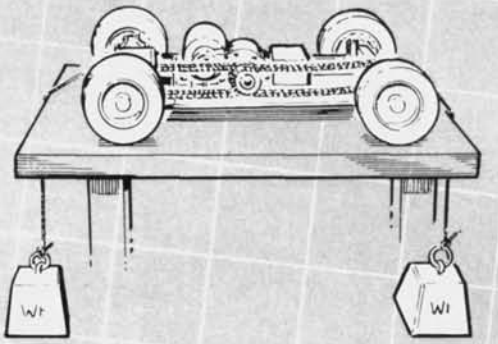
John Sorensen, Fremont, NB



BODY-CLIP PULLER

If your big hands have trouble pulling small body clips, try this little puller made from a nail. After removing the head, glue the nail into a dowel handle. Use a Dremel cut-off disc or a small saw to notch as shown. A crochet hook would also make a good puller. James recommends magnetizing the nail so that you don't lose the clip. (I've said it before: Why not tie the clips to the car with fine nylon monofilament?)

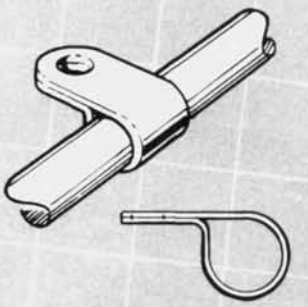
James K. Gaede, Larned, KS



DRIVE-CHAIN TENSIONING

First, loosen all the adjustment screws; then set the car on the bench. Attach a strong cord to one end of the car and to the sliding component at the other end. Hang suitable weights on the cords until the recommended degree of chain tension is achieved. After carefully checking the alignment of the chain sprockets, tighten the screws. Now you're free to make adjustments.

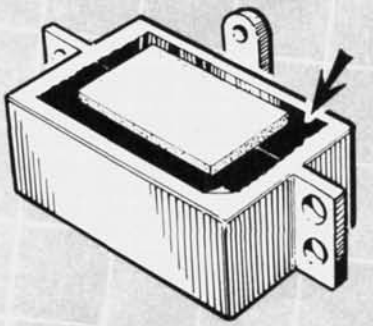
Denis Pastor, Temple City, CA



FOX BUMPER REPAIR

The mounting tab on the rear bumper of his Fox kept breaking off, so Bill cleaned the bumper (presumably with file and sandpaper). To cure the problem, he made up a simple "P" clip from a strip of aluminum and drilled a hole to fit the mounting screw.

Bill Stebbins, Louisville, KY



DOUBLE-STICK EASY CLEAN-UP

Before using double-stick tape to mount servos, etc., place a layer of vinyl electrician's tape on the servo, and put the double-stick tape on top of that. The vinyl tape also has great tenacity, but there's no messy residue when you peel off the double-stick tape.

Steve Harris, Santa Ana, CA

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o **Radio Control Car Action,** 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

Steve Topjian proudly displays his Kraco tractor-trailer that took him roughly three months to complete.

Even the tractor's fifth wheel (the plate above the wheels where the trailers attach) is functional. The wires coming from the back of the sleeper cab (the brake lines on a full-scale truck) are used to power the lighting system on the trailer.

Paying attention to every detail, Steve even hinged the forward portion of the cab body to open for maintenance as they do on the full-scale trucks. Note the scale Caterpillar® turbo diesel engine under the hood.

Contained under the roof of the sleeper cab are all the electronics for the big 18-wheeler (it actually has 14 wheels).

PHOTOS BY STEVE POND

by STEVE TOPJIAN

BREAKER ONE-NINE!

I'VE BEEN AN active modeler since the late '50s. My interest began with a 1/25-scale plastic car model (a gift from my father) and later turned to scale shipbuilding and scratch-building cars, model houses, etc.—*anything* that demanded attention to detail. I soon wanted to take each of my models to the scale "extreme," and although my experience in R/C is limited, this project was an opportunity to add yet another dimension to my modeling.

Having worked in the automotive industry for about 20 years, cars are an obvious modeling interest. My current job as a body man at Dennis Ercek Industries in Redondo Beach, CA, enables me to work on a number of race cars, including the No. 18 Kraco Indy car, which was driven last season by Michael Andretti. The car, as well as a number of its spare parts, regularly comes into our shop for body work and painting. Naturally, inspiration for my first scale R/C project came to me at work!

When I first decided to attempt the project, Nikko of America* was one of the few manufacturers offering anything resembling an Indy car. Its kit was possibly 1/12 scale in wheelbase and width, but, for the most part, the dimensions weren't consistently to scale. Making as many modifications to the body as I could, I went ahead with the project, capping it off with the blue and yellow of the No. 18 Kraco/Andretti machine. My first attempt with R/C had been relatively successful, but I didn't have the chance to flex my scale-building muscles, so this project is a *scale* race-car hauler like the Kraco team truck that's home to the Indy car while it's on the racing circuit.

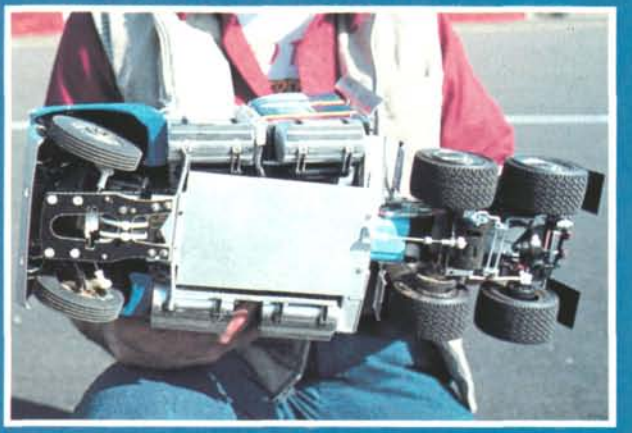
Intending to use the truck as a hauler for the completed Nikko Indy car, I began to search for a 1/12-scale truck kit, but I came up empty-handed. The closest I came to a 1/12-scale truck was a Monogram* 1/16-scale static kit. Undaunted, I began to gather the necessary parts to begin work on the truck. Apart from the actual mechanical parts required for a project of this magnitude, a key element when building anything to scale is being able to refer to the full-scale version. So off I went to the Kraco headquarters in Compton, CA, where I took a number of photos of the truck from different angles.

CONSTRUCTION: Starting with the tractor, I began to piece together what would eventually become a replica of the Kraco Indy car hauler that was as close to scale as I could get. As already mentioned, the Monogram Kenworth W-900 tractor kit was 1/16 scale, which would be too small for the 1/12-scale Indy car. To match the 1/12-scale dimensions of the actual trailer, the tractor had to be widened. As a "body man," I'm used to this type of precision work, so I wasn't as nervous as most would be when performing this type of scale surgery. However, there were still some butterflies in my stomach as I cut the Monogram body in half to widen it. New fenders

OVER THE ROAD, BY RADIO CONTROL

The suspension on the rear of the trailer was all hand-fabricated from square brass tubing and features coil-over dampening as well as two spare tires.

The scratch-built aluminum trailer also has functional side doors for additional access to the Indy car's mobile garage.



A trained eye will notice that the drive system is borrowed from a Tamiya Porsche 956 1/12-scale car, as is the front suspension.

were also in order, because the original equipment was too small for the larger tires. Having modified the plastic panels, I adapted a chassis from a 1/12-scale Tamiya* Porsche 956 to fit the dimensions of the cab. With the tractor assembly completed and ready for paint, trailer construction began.

To check the dimensions in relation to the cab, I made a cardboard mock-up of the trailer. The cardboard version seemed to be in scale with the tractor, so, with the help of Andy Palmer, I began work on the trailer. Most of the trailer is of .040 aluminum: One piece was wrapped around to make the sides, front and back, and a seam was welded into the front. Openings for the the rear door, side doors and lower cargo doors were then cut out. The side doors and cargo doors are simply swinging doors mounted on doll-house hinges, but the rear door required considerably more attention. The rear of the trailer has the rolling door seen on most tractor-trailer trucks and a custom ramp on which to roll the race car into the trailer. The rolling door is made of strips of brass that slide up and down a channel similar to those found on some garage doors or a roll-top desk. The car ramp is aluminum, and it's hinged at the bottom and in the center so that it flattens for the cars to negotiate it easily. The cable supporting the center of the ramp is part of a bicycle brake cable, and it retracts into the sides of the trailer when the ramp is upright or closed. Inside the trailer, the floor is stained oak.

The bottom of the trailer is as unique as its top. Just behind the rear suspension, there's room for two spare tires that are held in with a cross-beam. The rear suspension is constructed completely of brass square stock in a similar configuration to that of the suspension on the full-scale trailer. To withstand the big bumps, the suspension assembly is dampened with four oil-filled shocks.

To add to the scale realism, a completely functional lighting system was installed in both the tractor and trailer. The tractor has headlights and running lights powered by a 1.2V battery. The air-brake lines coming from the back of the sleeper cab are actually wires coming from the battery that powers the tractor's lighting. This connection also powers the running lamps on the trailer. Inside the trailer, there's a model-railroad interior, fluorescent-type lamp that's powered by a 12V battery tucked under the front of the trailer just behind the mount for the fifth wheel. Having installed the lighting, my next task was to supply my creation with the electronics needed to get it moving.

To provide a radio compartment, the top of the sleeper cab was hinged in the same way as the doors of the trailer. Inside this compartment, I mounted a Futaba* radio system, which consisted of an MC-112B electronic speed controller with reverse, and a receiver for

the Magnum Jr. radio system. The 7.2V 6-cell pack was stored under the sleeper cab and supplied power to the Tamiya Black modified motor. The motor drives the same axle used in the 956 kit, but the axle is now housed in a custom frame. With the electronics installed, it was time for the ever-important paint job.

Working in a high-caliber body shop has obvious benefits, and I was able to use the paint we use on the full-size Indy car. The paint is PPG Durethane polyurethane enamel, and the paint scheme I chose resembles that of the full-scale truck, with the same yellow and blue that are used on the race car.

"SCALE MODELING... IS AT THE HEART OF THE R/C INDUSTRY."

PERFORMANCE: A performance report isn't really necessary, as this truck isn't built for speed, climbing or crushing. It can be appreciated on the shelf just as much as on the pavement. I intended to build a tractor trailer with the finest possible detail, and whether it does 2mph or 200mph, the appeal of this machine comes from its appearance and *not* from its speedometer dial. Scale modeling like this is at the heart of the R/C industry. If someone at some time hadn't decided to build a scaled-down version of a dune buggy, we would never have had off-road R/C racing. While my contribution isn't nearly as important, it's still a great challenge and very rewarding to complete a project like this.

**Here are the addresses of the companies mentioned in this article:*
***Nikko America Inc.**, 851 International Pkwy., Richardson, TX 75081.*
***Monogram Models Inc.**, 8601 Waukegan Rd., Morton Grove, IL 60053.*
***Tamiya/MRC**, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.*
***Futaba Industries**, 555 W. Victoria St., Compton, CA 90220.* ■

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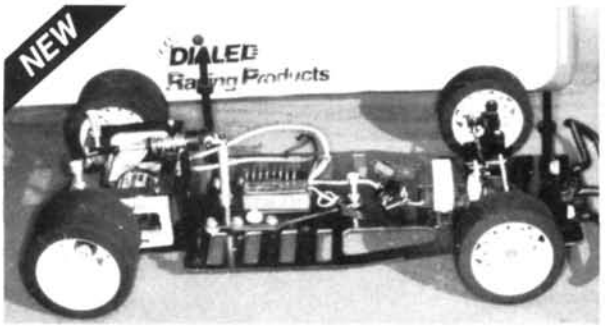

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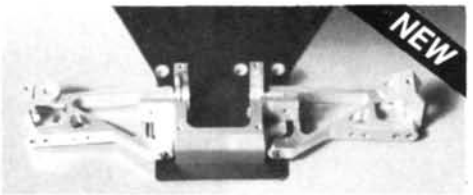

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READERS' RIDES

Welcome to "Readers' Rides"! We continually receive photos of readers' latest projects, so we've decided to start featuring some of the more innovative stuff to give all our readers a glimpse of these neat cars and trucks, etc. So here we go! If you want to be part of this new feature, send us a nice color photo of your project with a brief description, and we'll show it to the Ayatollah of Radio Controlla at the next editorial meeting to see if he'll publish it!

If we publish your photo, we'll give you a one-year subscription to RCCA, or extend your existing one, and you'll even be eligible for our "Readers' Rides Car of the Year Contest" in the fall of '89. Send your photos to Readers' Rides, R/C Car Action Magazine, 251 Danbury Road, Wilton, CT 06897. Start clickin', shutterbugs!

While Jason Cicero's Big Brute is stock, he did an excellent job of finishing and photographing it, and this is a major consideration when choosing our Readers' Rides winners. But Jason says he's added a Thorp diff and some spiked tires to improve traction since this picture was taken. He also tells us, "Yo! Your magazine is number one." Yo, Jason! Here's another year's subscription to our number-one mag.

Because this Clod Buster built by Al Herbst of Chatsworth, CA, is unique, we'll be doing a feature on it in the near future. For starters, would you believe wet-sump differentials, an alarm system and a hand-rubbed lacquer paint job?

Bill Hinsley, from Fair Oaks, CA, owns this wild-looking C&M Cobra II equipped with Futaba guidance equipment, a Novak speed controller, and TRC low-profile tires and wheels. Bill says the sharp-looking Nissan GTP body was the handiwork of Michael at Cordova R/C Hobby. Good job, guys!

This creation is the work of David Tolsma of Grand Ledge, MI. David's truck is a Tamiya Lunchbox that was converted to use a Mitsubishi Pajero body. After waving his magic wand, David tells us that this truck is now able to control its wheelies and climb hills that he'd never before considered trying. Lookin' good!

PREVIEW

A ROYAL FLUSH MONSTER TRUCK??

by CHRIS CHIANELLI

ROYAL CRUSHER

ROYAL PRODUCTS* has dealt us a decent hand in the form of a 1/10-scale monster truck—the Royal Crusher. The factory sent us a prototype (pictured) and a production kit about which contributor Rick Houle will soon deliver a full review. Meanwhile, I can tell you a little about the Crusher:

Immediately on running it, I noticed that its ability to soak up the bumps was *well above average*. No wonder: The front-suspension travel measured a full 1 1/4 inches, and the rear pegged out at over 1 1/2 inches. As far as I know, that's as much, if not more, than any other available truck. The suspension features upper and lower wishbones, which look substantial, while the tub-style chassis will probably do a good job of keeping out the dirt.

The only definite *stink* award for the Crusher goes to its speed controller: It's one of the "spot-welder-special" types with foil panels that self-destruct so easily. In all fairness, however, more often than not, stock speed controllers are the weakest component in kits.

All in all, the Crusher shows promise, and there are rumors that you'll be able to buy one for under 90 bucks. I can say nothing yet about the Royal Crusher's durability, i.e., does the diff strip after an hour, or do the suspension parts shatter easily? These decrees fall directly under the auspices of the Dirt Master General; watch for his report soon!

**Here's the address of the manufacturer featured in this article:*
***Royal Products Corp.**, 790 West Tennessee Ave., Denver, CO 80223.* ■

PROJECT

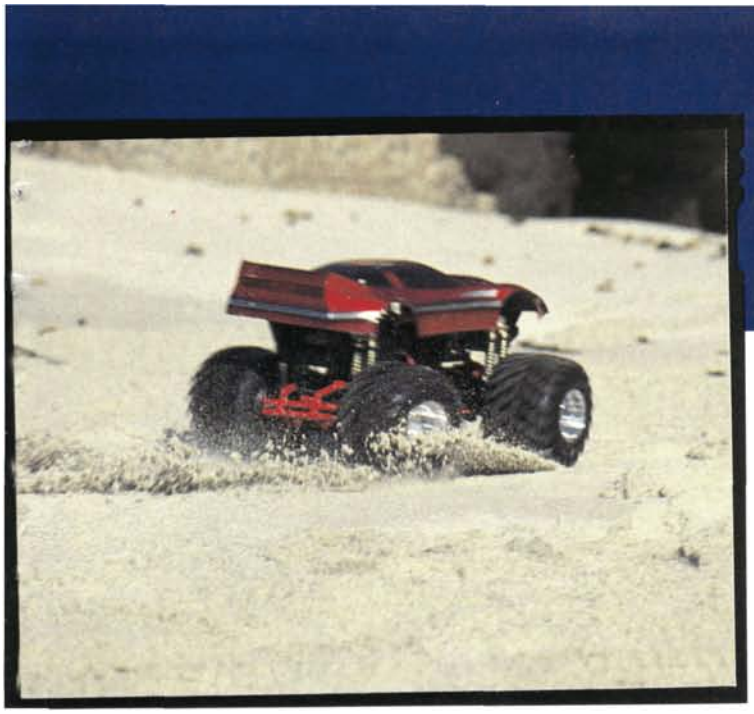
CLOD BUSTER

by STEVE POND

ALL HAIL THE HUMUNGOUS!

KING OF THE MONSTER mashers, Tamiya's* Clod Buster was the undisputed winner of last year's Monster Truck Shootout when combining the results from the six performance tests. While the size of the truck makes it an unlikely candidate for a victory in monster truck racing, it has many other uses, including car crushing, sled pulling and "mud bogging." Its mammoth size and twin motors make it an ideal truck with which to venture where no other R/C vehicles (including other monster trucks) have ever dared to go before. Seemingly impassable terrain, or the rooftops of some unsuspecting R/C cars, are all fair game for this behemoth, as it's capable of clearing just about any obstacle you put in front of it. When not out bashing

PHOTOS BY STEVE POND

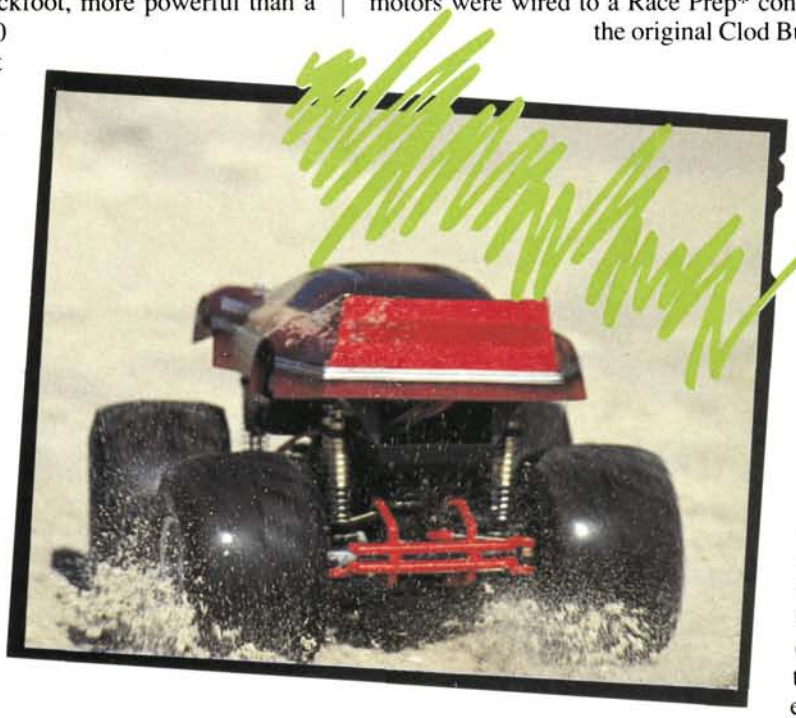


the countryside, you could be pulling a sled loaded with a weight that would scare even the toughest of trucks.

During our Monster Truck Shootout tests, a stock Clod Buster made short work of more than 41 pounds on the sled, and this sent the rest of the fleet to the sick bay. Why, you might ask, do we feel compelled to put more punch into the undisputed heavyweight champ of the world?

Just like many other R/C monster maniacs, I'm driven to build the *ultimate* monster truck despite the strength of the basic vehicle. Faster than a speeding Blackfoot, more powerful than a hopped-up Bruiser, able to leap 10 Ultimas in a single bound...you get the idea.

However, despite the Clod Buster's unparalleled popularity, there are relatively few performance parts available. There are a number of dress-up parts for use with the original Chevy pickup body (e.g., bumpers, nerf bars, roll bars and other miscellaneous gleaming parts), but when it comes to milking it for more juice, your options are few. Nevertheless, to see just what I could get out of the Clod Buster, I decided to forge ahead with the project using the available parts.

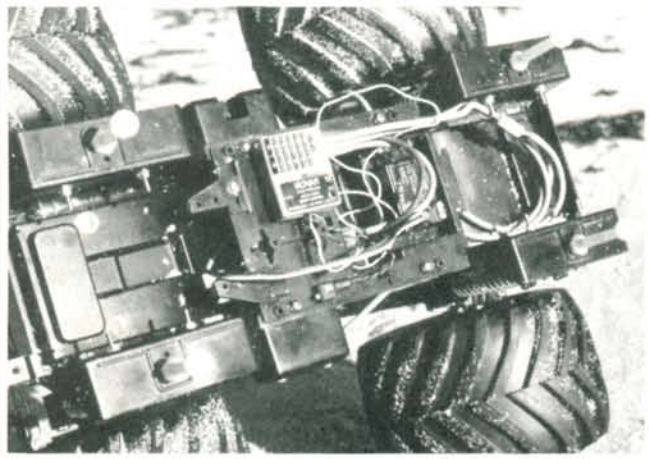


The stock electrical hardware was the first to see the bottom of the circular file. The original speed control was scrapped in favor of a Novak* 1X, which was up to the task of delivering the power to the two new Trinity* Clod Buster motors. While other motors can be used, you'd have to reverse the polarity of the front motor, and this would necessitate resetting the timing. The Trinity matched set of motors is designed for use in the Clod Buster without the power/economy switch (who's looking for economy?). The motor for the front axle is wound and timed for running in reverse rotation, so it's a simple bolt-on procedure when using the stock pinion. (I haven't come across any accessories that allow the use of other pinions.) When each of the motors had been bolted into place, they were connected to the 1X with Astro Flight* heavy-duty 14-gauge wire. For convenience, both motors were wired to a Race Prep* connector in parallel (with the original Clod Buster wiring, the power/economy switch was in the parallel position for the power mode). Wiring in parallel simply means connecting both positive leads to one side of the connector and both negative leads to the other side.

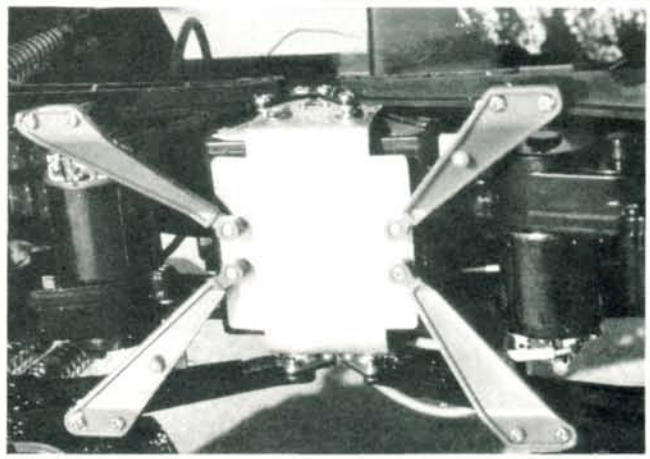
Working alongside the 1X is the receiver for Futaba's* new PCM 3-channel radio system. Among some of this system's more outstanding features are its pulse-code transmitting capability (which is highly resistant to interference), electronic trim adjustments (which are readily accessible for "on the fly" corrections), and exponential for both steering and throttle channels. The radio also has a signal-loss

PROJECT

CLOD BUSTER



The top side of the Clod Buster is now very simple with a Novak 1X electronic speed controller, the Futaba PCM receiver, and an FP-S131S Futaba servo down below that handles the steering chores.



The ESP chassis brace supports the area where all the suspension components attach to the chassis. This is reported to be a weak area of the Clod Buster chassis.

The ESP suspension lift kit made it possible to use the Kyosho Gold oil shocks even though they're about 1/2 inch shorter than the stock units. When used with the stock shocks, the truck will be lifted about 1/2 inch.

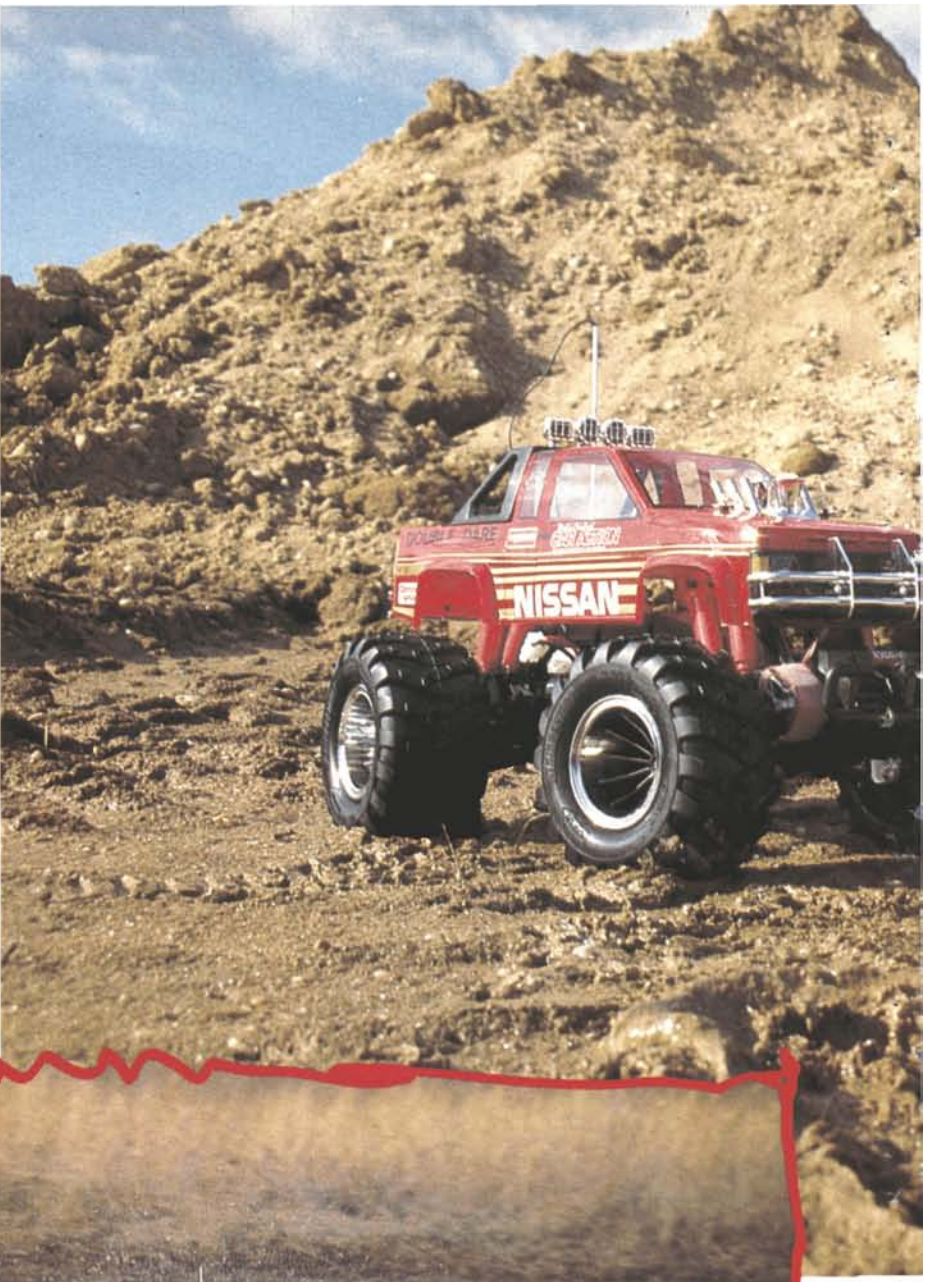
While these two Trinity motors look identical, one is wound for opposite rotation for use without the power/economy switch that normally reverses the polarity to one motor.

fail-safe feature that will return the servos to a pre-set position if the signal is lost. There's also a mixing function for the twin-servo steering control commonly used in 1/4-scale racing. The radio's four-wheel-steering differential wasn't used, because the Clod Buster's four-wheel steering operates from one servo instead of two.

Next, I installed the ESP* chassis accessories. ESP's line of parts includes an aluminum chassis brace for support where the suspension arms attach to the chassis mid-ship, aluminum motor supports to replace the original plastic braces, a suspension-lift kit, and a pair of suspension braces that spans the suspension arms from the bottom. The chassis brace appeared to lend a great deal of support to the center section of the chassis where the suspension arms are attached. This is reported to be an area that occasionally breaks on sustaining a hard knock. Just be sure that your steering servo and hardware are in place and properly adjusted before attaching this brace. The chassis brace covers the screws that attach the servo to the chassis. To remove the servo once the brace is in place, you have to remove the front and rear axle assemblies as well as the suspension pivots to get to the screws (I speak from experience!). The suspension-lift kit turned out to be a necessity, as the eight Kyosho* Gold shocks are about 1/2-inch shorter than the original Tamiya shocks. The lift kit made

(Continued on page 92)

GODZILLA VS. MOTHRA!



MONSTER TRUCK FANATICS have flooded our offices with letters demanding the *ultimate* truck shootout: the Clod Buster versus the Double Dare. Some even dare to question our resolve to bring you a no-holds-barred, winner-take-all contest. As the manufacturers hold their breath, *RCCA* accepts your challenge! Put down your pens and stop licking your stamps; let the "Clash of the Titans" begin.

The participants in this battle are the older, proven, MRC-Tamiya* Clod Buster and the younger new challenger, the Kyosho* Double Dare. Why are these the two chosen to face-off? Because they're the only two monster trucks that combine four-wheel drive and four-wheel steering with twin motors. Until recently, there was only the Clod Buster in this class, but now the Double Dare is on the scene and ready to challenge the status quo.

Those of you who remember last year's Monster Truck Shootout in *RCCA* may recall that the Clod Buster only came in 6th out of the nine trucks tested. That hardly sounds like a performance worthy of inclusion in "Clash of the Titans," but *performance* is the key word. The results of last year's shootout were decided by adding each truck's accumulated points in six separate categories. Five of these categories (sled pulling, acceleration, top speed, handling and duration) were actual *performance* tests. The sixth category wasn't performance-related, but based on the retail price of each truck. Many dedicated Clod Buster fans have rightly pointed out that their truck was the *winner* of the five performance categories combined. They also argue that they were *more than willing* to pay the price to own the *top-performing* truck.

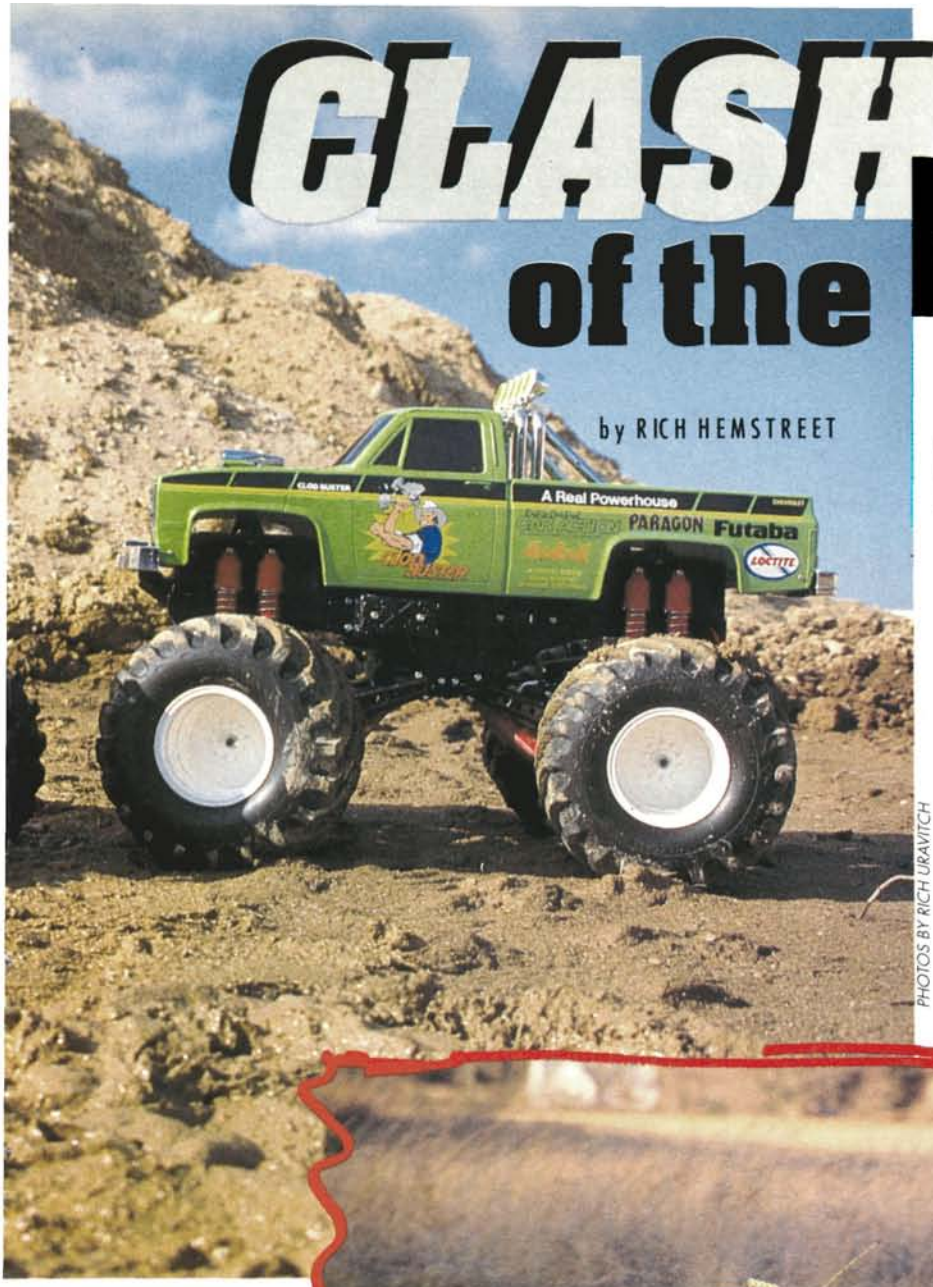
So, based on last year's performance, the Clod Buster beat the other eight trucks that were available. That sounds more like the performance of a Titan!

With its Chevy Fleetside body perched above 6.25-inch-tall tires, Tamiya's Clod Buster looks *huge*. Owing to the 4.25-inch-wide tires mounted on each wheel, it's almost 15 inches

CLASH of the TITANS

PART I

by RICH HEMSTREET



PHOTOS BY RICH URAVITCH

Left: To determine who will be crowned King of the Hill, the challenger and defender meet face to face on a level field.

Below Left: Kyosho's new Double Dare is ready to take on the top performer from last year's Monster Truck Shootout.

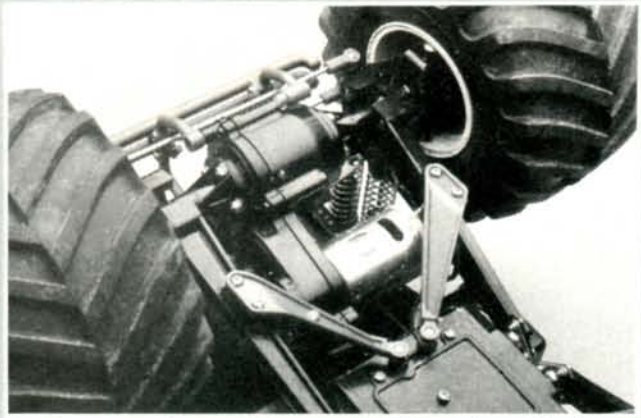
Below: Never afraid of a fight, the Tamiya Clod Buster won't back down from any challenger.

wide, and with a 6-cell battery pack, this monster weighs in at over 9 pounds. Eight heavy-duty coil-spring shocks provide the suspension dampening, and a single 3-step speed controller is connected to both RS-540S motors. Sturdy, rigid axles are used both front and rear, and the injection-molded Chevy body is a favorite of monster-truck enthusiasts.

The Double Dare's only claim to fame is its bold challenge of the Clod Buster's twin-motored turf. Appropriately, Kyosho has chosen to outfit its monster with a Nissan truck body, thus challenging the Chevy-bodied defender. This slightly shorter challenger rides on top of 2.8-inch-wide by 5.7-inch-tall tractor-tread tires mounted on chrome-plated rims. Twin LeMans oversize shocks are located on each corner of its fully independent suspension system.

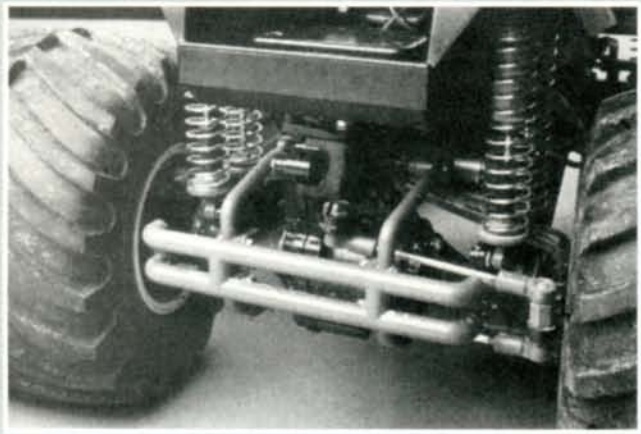
The scoring for the "Clash of the Titans" will be simple and straightforward. One point will be awarded for a win in each of eight events, and no points will be awarded for ties. If the results of the eight events produce a tie, a bonus point will be awarded to the truck that showed the greatest mechanical durability during our photo and test sessions.

The eight performance events will be: sled pulling, car crushing, handling, maneuverability, acceleration, top speed, duration and hill climbing. The sled pulling and the car crushing will be run according to the NR/CTPA guidelines, and handling scores will be based on lap times over a given course. The top

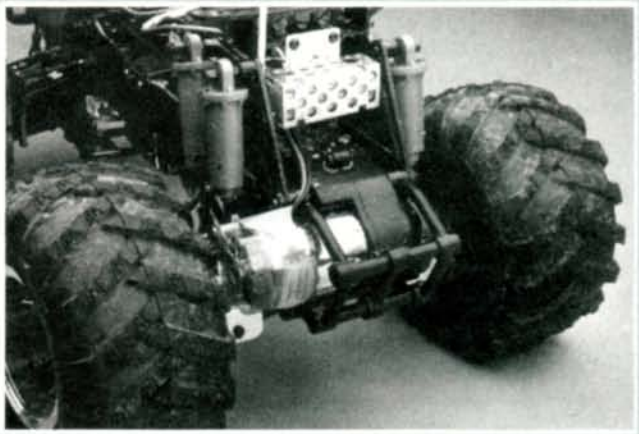


Trailing-arm-style suspension is used on the Tamiya truck. The motors are mounted amidship in the Clod Buster.

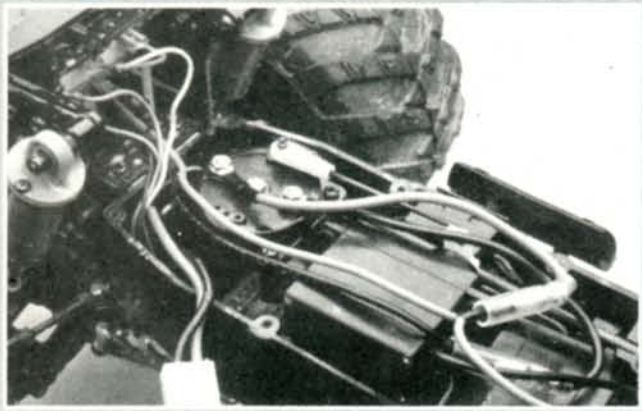
A-arm independent suspension helps the Double Dare handle jumps and car crushing.



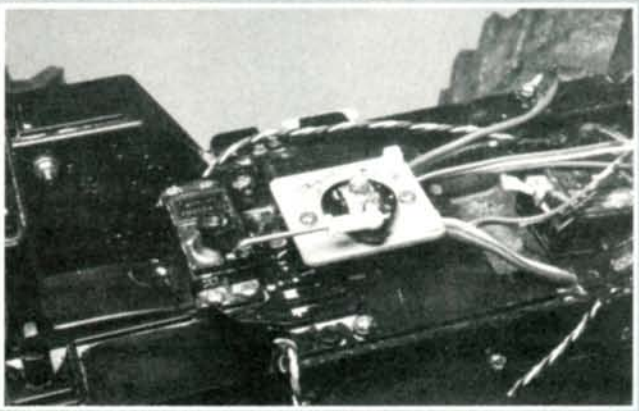
The Clod Buster employs eight coil-over shocks to smooth out rough terrain. Notice the heavy-duty steering rods.



Non-adjustable dual shocks are used at each corner of the Double Dare's independent suspension system. The motors are mounted behind the rear axle and ahead of the front axle.



Kyosho's new heavy-duty speed controller delivers power to twin LeMans 05 stock motors.



Even though it isn't very refined, the three-speed forward/reverse on the Clod Buster controller performs well

score for maneuverability will go to the Titan with the sharpest combined turning radius—left and right—both in forward and reverse. Acceleration will be straight-line drag racing over a relatively short course, and top speed and duration will be run as they were in last year's Monster Truck Shootout. The hill-climbing test will be won by the truck that successfully scales the steepest gradient, and the first truck to earn five points will win the "Clash of the Titans."

Will the Clod Buster successfully defend its turf, or will the Double Dare brashly take over? Be prepared to take cover next month when *RCCA* boldly declares the victor in the "Clash of the Titans," Part II.

**Here are the addresses of the companies mentioned in this article:*
***Kyosho,** distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
***MRC/Tamiya,** 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.* ■

QUICKSILVER PULLER

by DAVE SPROUL

Not only do the wheelie bars work, but they're also adjustable. Medium-density foam is stuffed inside the Big Bear tires.

Wild wheelspin sets in as the Quicksilver is stopped dead in its tracks.

ALL SHOW AND STILL MORE GO!

WHAT ARE YOUR OBJECTIVES when building an R/C vehicle? One of *my* priorities is creating a scale model that looks as much like full-scale as possible. The Quicksilver project was designed to capture the look and feel of a full-scale 2WD pulling truck. To achieve this, I started by scratch-building the aluminum frame from 1/8x1/2-inch bar stock. Aluminum sheet was used to construct the radio and battery trays. When the frame had been completed, I narrowed a Tamiya* Bruiser rear end (chosen for its scale appearance) by 4 inches and fitted it to the frame. The front axle was cut from 1/4x2-inch aluminum bar stock to resemble a dropped axle. Tamiya Hornet steering arms were used, and ball bearings were installed in the front wheels and the rear end. Since this is a pulling truck, no suspension was used.

To transfer power from the motor to the rear end, I chose a Kyosho* Ultima transmission. The differential was locked, and the transmission mounted sideways in the frame; a drive shaft connects the rear end with one axle output to the transmission. A Black Magic* No. 7001 Pulling Motor was fitted to their Gear Reduction Unit and then bolted to the Ultima transmission. The overall gear ratio is about 60:1.

Electrical power was supplied by two battery packs: one 6-cell and one 7-cell wired in series (15.6 volts)

TRUCK PULLIN'—USA

DAVE SPROUL DIDN'T BUILD the Quicksilver simply for its scale appearance; he also planned to compete in organized R/C pulling events. Ordinarily, if an R/C racer wants to compete, he just builds his car according to ROAR or NORRCA rules and then goes racing.

But Sproul didn't have an organization to turn to, so he started and became the president of the National Radio Control Truck Pulling Association (NR/CTPA). The NR/CTPA has developed 11 classes for 1/10- and 1/12-scale electric pulling. The rules cover everything from a box-stock Tamiya Blackfoot competing in 2WD Stock Class to a handbuilt, four-motor, 4WD, 28-cell monster pulling in the 4WD Open II Class.

The Quicksilver competes in the 2WD Open I Class, which is limited to just one commercially available R/C motor with no dollar limit. Up to 14 sub-C 1700mAh cells can be used to power the Quicksilver, and according to the rules, any combination of gearboxes is permitted in the Open classes. Thus, Sproul was able to combine a Bruiser rear end with an Ultima transmission and a Black Magic gear-reduction unit. While the maximum weight for the class is 15 pounds, the Quicksilver is a lightweight at only 7 pounds.

In its 1989 Official Rule Book, the NR/CTPA also addresses Monster Truck Competition for those of you who are into car crushing rather than sled pulling. There's no reason why these events can't be just as exciting as their full-scale counterparts.

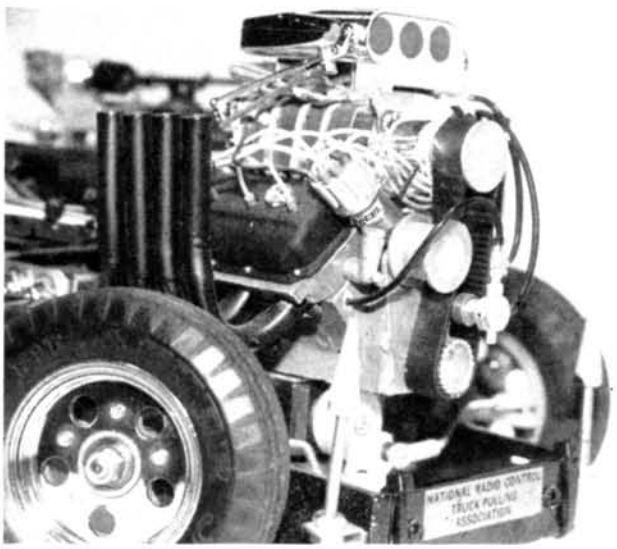
For more information, contact, NR/CTPA, 246 Pine Run Rd., Rochester, PA 15074. ■

The Quicksilver pulling truck is designed to compete in the 2WD Open I Class of the NR/CTPA.

through a Hydro Zeta electronic speed controller.

A Futaba* Magnum 3-channel radio controlled everything on the Quicksilver. The lights on the body actually work (including a RAm* Electronics strobe light inside the cab), and an electric winch handles the body lift. The lights and body lift are operated by two sets of switches: One set is radio-controlled, and the other is manually controlled for use during static display.

Lexan bodies are great for race cars, and I've used many, but, for a scale, detailed appearance, injection-modeled styrene can't be beaten, and that's why I chose a Tamiya Clod Buster Chevy body. To modify the body, I filled in the original rear-wheel openings and relocated them rearward, removed the side window frames for a one-piece window effect and cut a hole in the hood for the scale Hemi. The rear tonneau cover was made of fiberglass sheet and painted flat black, and front parking-lamp lenses were cut from a used Lexan fog-light lens. The side marker lights are three rectangular yellow LEDs glued together and fitted into the stock location, and the rear tail-lamp lenses were hand-formed from a red acrylic sheet. When the body modifications had been completed, I sprayed it with Testor's* Model Master Silver Metallic paint. The gradually darkening colors were also painted with Model Master paints: Mist Fern, Gray Fern and Black Pearl. Chrome trim was made from Bare Metal Foil and the "Quicksilver" lettering was cut from silver iridescent Mylar and outlined with Testor's red paint. Cowl-mounted gauges were made from 1/25-scale model fog lights fitted with instrument faces.



This Keith Black 1/10-scale Hemi looks as if it's ready to be fired up. Notice the steering servo hiding beneath it.

The awesome 1/10-scale Keith Black Hemi is an old MPC model kit that's no longer produced. After detailing the engine, which included scratch-built headers, it was fitted atop the steering servo. This addition to the truck really makes for a realistic appearance.

The body was hinged at the rear and a "dump bed" mechanism operated by a hobby motor winch was used to lift the body. An automatic self-locating front body-mount system was made with ink-pen caps and home-made body posts.

Up front, Tamiya tires are mounted on CRP* chrome rims,

(Continued on page 128)

RACER'S EDGE

In the pits, Joel is keeping his spirits up, despite the 35-degree rainy weather.

WHAT'S GOING ON IN NIPPON

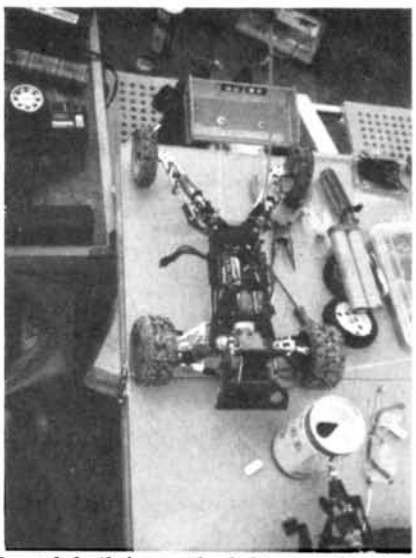
by JOEL JOHNSON

LAST FALL, the Kyosho* Corporation invited me to Japan, to visit its new facility and to race in the Kyosho All Japan Cup race at its new plant in Atsugi. There were two separate championships: 1/12-scale On-Road and 1/10 Off-Road. A month before the two races, a series of qualifying events had been run to determine the top 120 drivers.

At the new plant, Kyosho has built two world-class tracks. The super-smooth asphalt road-race circuit is for 1/12-scale cars and the new Kyosho 1/8-scale motorcycle. The circuit features a roadcourse laid out inside an Indy-style oval, and a covered driver's stand between the two tracks is used for both. To show how much class Kyosho has, there's even a drivers' clubhouse overlooking the tracks. This second-story "penthouse" is for Kyosho Owners Club members only, and since you can eat and drink while keeping an eye on the racing, being there really makes you feel important! The Off-Road course consists of a tri-oval with the tight sections running through the infield. As far as traction is concerned, this has to be the best track I've ever raced on. The jumps on the track aren't very big, but they're tricky to negotiate, and bumps seemed to develop *everywhere!*

Not only does Kyosho have an excellent track facility where it tests all its new products, but it also has a fully equipped machine shop staffed by several full-time engineers who are involved in research and the development of new products. In my opinion, these engineers have dream jobs; they're *paid* to work on R/C cars all day! Virtually everything that you'd ever need to make, build or design an R/C car is on the premises, and if it *isn't* there, they order it and have it delivered the following day. Most of these engineers are racers, and they're all very enthusiastic about their sport. This year, Kyosho is sending several of them to the U.S. to learn about American racing and technology. They'll then have a broader base on which to work out their new product designs. This shows how *serious* Kyosho is about the future of R/C racing.

As for the latest trends, I found that in Off-Road, people were experimenting with front-wheel-drive cars and were having some limited success with them. The cars look rather silly and frog-like, and they almost run like frogs on the track, too. If the track is relatively smooth and very slick, then a front-wheel-drive car has an advantage, but *only* under those circumstances.



Scratch-built front-wheel-drive cars have been showing up more often at Japanese tracks.

I also glimpsed the new Avante from Tamiya*. Traditionally, Tamiya hasn't been known for its racing cars, but we should keep our eyes open for them in the near future. Tamiya has lots of money and resources, and if my friends in Japan are right, the company will have some really competitive racing cars very soon. In the new version of the Avante, many of the nice-looking but unproven aluminum suspension parts have been replaced with nylon parts.

Kyosho has some new cars on the horizon, but don't expect to see them for at least a year. New designs for the Ultima and the Optima Mid are also in the works, and we might see these new kits before the end of this summer. One car is called an Ultima Pro and the other, an Optima Mid Custom Special. These kits are available in Japan right now and will, I hope, be shipped to the U.S. very soon. Also look for a new front-wheel-drive car from Kyosho—possibly *very* soon .

The Team Kyosho clubhouse overlooks the tracks. Food and drinks are always available during race and practice time.

An aerial shot of the fantastic Kyosho complex. Super-clean on-road circuit to the right; off-road course to the left. Drivers' stand is centrally located.

The dominant trend in Japan seems to be miniaturization, which is just the opposite of what's going on here. A growing fad is for 1/8-scale Kyosho motorcycles. There was an All Japan Cup for the motorcycles, and there were almost *150* entrants. Unfortunately, in Japan, there's no room left to do *anything*, so the R/C companies are forced to make things smaller to fit the available space.

While competing in both of the Japan Cups, I saw the work of a truly profes-

(Continued on page 130)

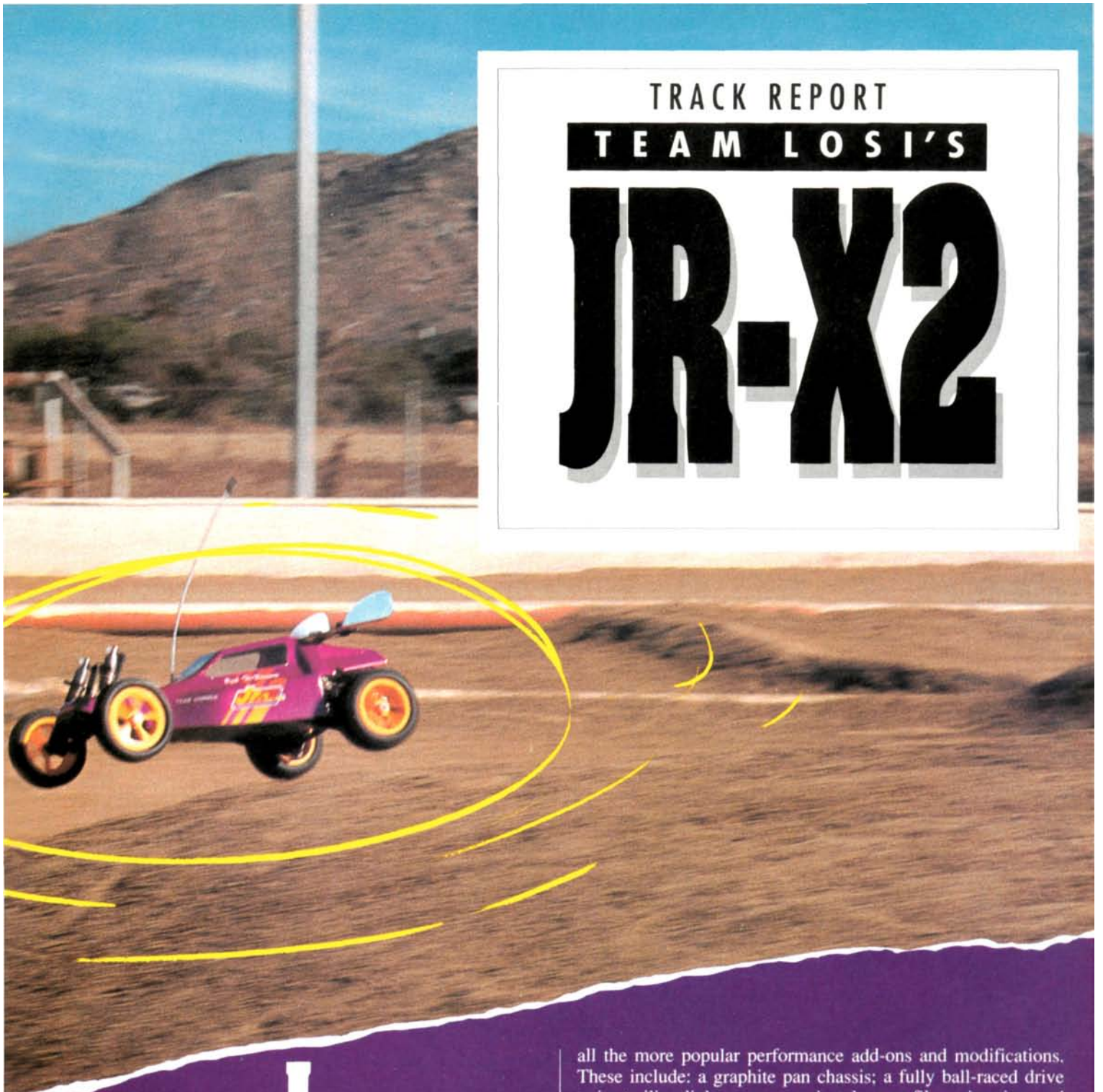
ZONE!

A Trinity Monster Horsepower stock motor is connected to the JR-X2's "low-rotating-mass" differential. This appears to be a very efficient drive train.

by RICK HOULE

And then there were three... 2WD contenders, that is.

PHOTOS BY RICK HOULE



TRACK REPORT

TEAM LOSI'S JR-X2

IF THE CRP "CHALLENGE" and U.S. Western Indoor Championship races are any indication, there appears to be a "new kid" on the block in 2WD off-road racing. After nearly two years of waiting, the JR-X2 has arrived with a bang! Team Losi's* JR-X2 grabbed early headlines when it captured ROAR's 2WD Stock title in 1988, and it has continued with overwhelming success at the aforementioned annual events! This new contender will surely vie for the 2WD Off-Road World Championship in Australia later this year.

Developed and produced by Team Losi, the kit for this car can best be described as a "total-concept" kit. Many R/C cars require loads of after-market hop-up parts to be competitive. The total-concept idea is simple: Produce a kit that *already* incorporates all the more popular performance add-ons and modifications. These include: a graphite pan chassis; a fully ball-raced drive train; trailing-link rear suspension; low-profile racing tires and wheels; and an exotic transmission with 48-pitch, low-rotating mass, self-lubricating gears! Many thoughtful touches, e.g., the turnbuckle 4-40 control-link suspension rods and self-locking wing fasteners, are also a real treat.

The kit for this article was one of the original "Limited Introduction Series"—the ones *without* a picture of the car on the box. These original kits had some problems, but we've been told that these have been corrected in the regular production models.

All the bolt-on parts were neatly arranged in clear poly bags marked A through G to coordinate with the step-by-step instructions. The graphite chassis is precision-cut and pre-drilled with countersunk holes. The off-road racing body is made of a clear polycarbonate and is accompanied by a rather stylish and effec-

JR-X2

Type ..... 2WD off-road
Scale 1/10
Sug. Retail Price $299.95

DIMENSIONS:
Overall Length ..... 14.75 inch
Width ..... 9.625 in
Height ..... 6.375 in
Wheelbase ..... 10.5 in
Front Track ..... 8.625 inc
Rear Track ..... 8.625 inche

WEIGHT:
Gross (w/bat.) ..... 52 ounces

BODY:
Type ..... Off-road monocoque
Material ..... Polycarbonate

CHASSIS:
Type ..... Off-road pan
Material ..... Graphite composite

DRIVE TRAIN:
Type ..... 2.18:1 final-drive-ratio gearbox (48-pitch gears)
Differential ..... Ball type
Bearing Type ..... Full ball

SUSPENSION:
Front: Type ..... Independent lower A-arms w/adjust. upper links
Dampening ..... Oil-filled, coil-over shocks
Rear: Type ..... 5-link trailing-arm independent system
Dampening ..... Oil-filled, coil-over shocks

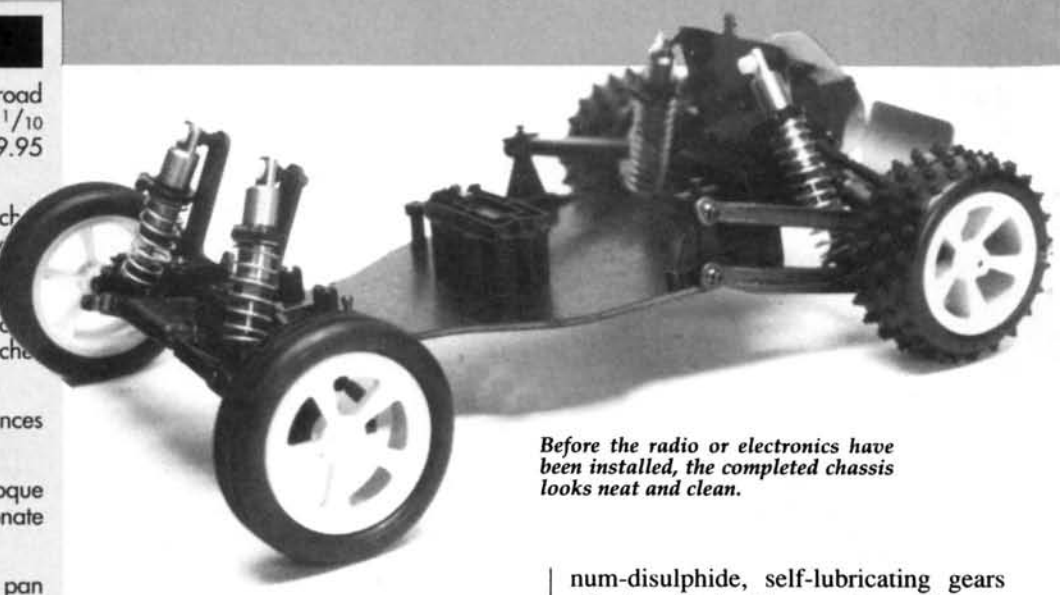
WHEELS:
Front: Type ..... Single-piece five-spoke
Dimensions (DxW) ..... 2.375x .75 inches
Rear: Type ..... Single-piece five-spoke
Dimensions (DxW) ..... 2.1875x 1.375 inches

TIRES:
Front ..... Low-profile, grooved
Rear ..... Low-profile, spiked

ELECTRICS:
Motor ..... Trinity Monster Horsepower Stock
Battery Type Required 6-cell
Speed Controller Novak-1

OPTIONS AS TESTED:
Airtronics XL-2P radio system; JG front bumper; Team Hammer racing wing; Race Prep spiked front tires.

COMMENTS:
Quick to build and quick on the track. While I had a few problems with my limited introductory kit, the new production kits are reportedly holding up well, and I've yet to break any of my replacement parts. With all the high performance parts included in the stock kit, you *know* the JR-X2 will be competitive.



Before the radio or electronics have been installed, the completed chassis looks neat and clean.

tive wing. A full complement of Team Losi JR-X2 decals is also included.

There were numerous errors in the instructions, but corrections are given on a separate sheet of paper. These "typos" are so bad that they're almost comical, but they could lead to a lot of backtracking, so read everything carefully before beginning construction! At least, there are plenty of good diagrams to help you.

ASSEMBLY: By following the sequence of steps described in the instructions and opening each bag only as directed, the car can be completed in 2 1/2 to 4 hours, depending on your level of expertise.

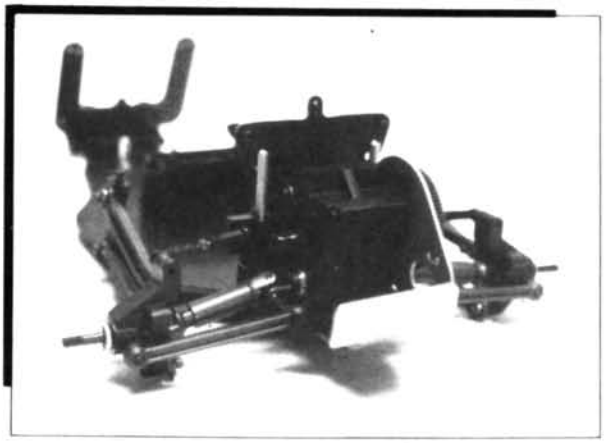
The materials used in this car are so special that the car's producer, Gil Losi Sr., wouldn't divulge what was used in some of the components—especially the drive train. The lightweight plastic-looking material looks remarkably like that used on the M-16 rifle stock and handgrip. Mr. Losi was quick to express his doubt that the materials were identical, but he did say something about "molybdenum-disulphide, self-lubricating gears able to withstand temperatures of up to 475 degrees."

By mating the contents of bag A with the graphite chassis, the main chassis assembly was completed in an incredible 21 minutes and 30 seconds—and that's including the breaks I took to work the screwdriver cramps out of my fingers!

The trailing-arm forward supports or "side bulkheads" are installed first, followed by the two front steering posts. The instructions didn't mention the use of any form of thread-locking agent, but I used a small dab of Loctite* 242 on the flat-head 4-40 screws before I secured the steering posts with them.

The front and rear shock towers are then secured to their respective bulkheads. The rear bulkhead is a very light piece with the JR-X2 logo molded in. The front bulkhead has been identified as one of the "weak points" of the original kit. According to Mr. Losi, these and other components have been "re-engineered" for greater strength.

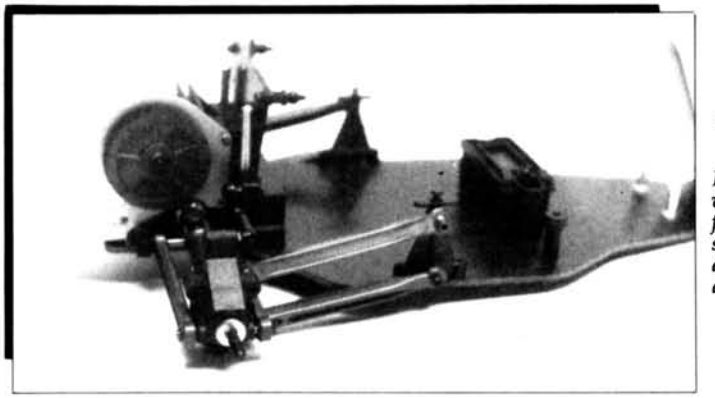
Bag B contains the transmission and, quite possibly, the single most important



Not only is the gearbox highly efficient, but it's also very compact.

reason for this car's incredible speed off the line. The differential is made up of "low-rotating-mass (LRM)," self-lubricating, 48-pitch gears and involves the kit's most complicated assembly, so pay attention to detail here.

The front and rear top shock mounts seem slightly unusual, because the shocks don't fit tightly on them and have a slight amount of play. This doesn't appear to be that's particularly useful for adjusting the diff.



For maximun wheel travel, Losi's five-link rear suspension uses extra-long, dual, rear trailing arms.

The diff-ball holes in the diff gear each get a small dab of a burgundy-colored grease that's thicker than molasses in January. When assembling the diff, pay attention to the coned, "bellville" washers. The cone configuration is so slight that it's difficult to tell which way they point, and this is critical to the assembly. Follow the exploded-view diagram closely. The typos don't help, but the diagrams seem to be reliable.

I encountered a small problem when positioning the two spacers that go on either side of the tranny on the U-joint outdrive shafts. The spacers (sort of flanged washers with one side wider than the other) aren't clearly defined on the diagram. The instructions simply tell you to install the spacer with the "flat" side away from the U-joint, and I'll be damned if *both* sides of that sucker aren't flat! I had to assume that the instructions referred to the *wider* side of the spacers, and I installed them facing inboard toward the transmission.

The universal slider/drive shafts carry the ponies to the rear wheels and are quite tricky, though a real chore to assemble. Losi supplied a nifty wrench with which to install the drive-shaft ends on the U-joint cross pins, but I just used a pair of curved, needle-nose pliers and copious amounts of patience.

Bag C contains the unique Losi 5-Link, trailing-arm rear suspension. All car builders—experienced or novice—should have a small set of nut drivers ($^3/_{16}$- to $^3/_8$-inch is a good range). Allen drivers are also handy wrenches, including a long one an oversight, but just the way they were engineered.

Composite ball joints are created by sliding the drilled, chrome balls onto $^1/_2$-inch 4-40 screws and installing them on the side bulkheads. These balls should spin freely, so "snug" the screws against each ball, then back them off until the ball is free. Use this procedure on the ball joints of each hub carrier, too.

The rear pivot supports for the trailing arms are installed with hinge pins and secured by E-clips. The hub carriers are attached by sliding the male sections of the slider/drive shafts into the female shafts on the tranny and securing them with hinge pins. The trailing links are snapped onto the composite ball joints of the hub carriers and the side bulkheads.

The two rear control links are made by installing nylon rod ends onto turnbuckle 4-40 rod. The tuning tips in the owner's manual suggested suitable adjustments for racing. However, when I dialed-in zero camber on the rear wheels, I had to screw the rod ends all the way onto the 4-40 rod. This was no easy task, as the fit was too tight to use the supplied wrench on the rod ends, and I had to grip them tightly with channel locks (taking care not to damage the ball cups) and twist the turnbuckle with the wrench. You might prefer to shorten the rods before installing the ends.

The complete front suspension is contained in bag D. While building the front suspension, I had the impression that this car wasn't designed to ram hard objects like brick walls or curbs. There's no front

(Continued on page 135)

Wanted:

AUTHORS
CONTRIBUTORS
PHOTOGRAPHERS

We think a lot of our readers have ideas that are worth sharing. How many times have you read an article and said "I could do that!" or "That's not the only way to do that; mine's easier!" Could very well be! Here's your chance! We'll be expanding **Radio Control Car Action** and are looking for additional contributors to help us accomplish this objective. Of key importance is the ability to take good photographs; the writing we can help you with. Interested? It's much easier than you might think.

Let's hear from you. Send in your ideas, articles, thoughts and photos; we're looking forward to it.

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R/C CAR ACTION
AIR AGE PUBLISHING
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DIRT DIGEST

by BILL O'BRIEN & BOB KANE

OFF SET WHEEL DYNAMICS

THERE'S AN OLD SAYING about the grass always being greener on the other side of the fence, and I'm sure we've all agreed with it at one time or another. Isn't that why we're always finding new ways to transform our R/C cars?

Take the RC10: you'll easily spot almost a dozen manufacturers making sprint car, oval, on-road or truck conversions for it. Add the people who make graphite chassis, aluminum wheels, trailing arms, gear sets, etc., and you might wonder why any manufacturer would bother to design a vehicle in the first place if everyone else can improve it so much.

Where I live, the current "bug" is truck conversion, and I'm as smitten with the disease as anyone else. One of my Frogs (newly christened, "FrogFoot") sports a host of add-ons including Ford Ranger front wheels and tires (from an old Tamiya* kit) and Blackfoot rear wheels and tires that bolt directly on. The front Blackfoot wheels don't fit because the axles are too short, but you expect to run into those types of problems when you scratch-build a model.

Thankfully, we can buy kits to make many of the changes we want for our cars, but even these kits are often less than perfect—after all, they're usually designed to use easy-to-find, off-the-shelf parts and this can sometimes lead to problems. A young R/C fanatic wanted to know why his recently converted Optima Mid Monster Truck had a bad case of the rear-wheel shimmies.

He'd been running the truck pretty hard, bouncing over moguls and diving down into ruts so generally stressing the suspension. Following the manufacturer's

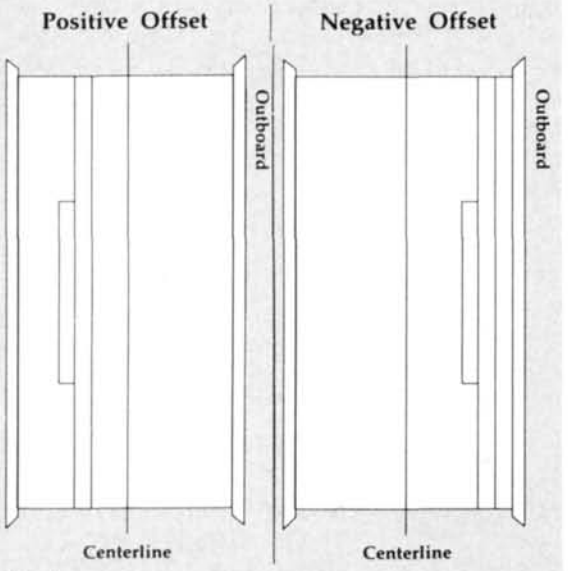


Fig. 1

The wheel on the left has the mounting point inboard of the center line, so it has positive offset. The negatively offset wheel on the right has the mounting hub nearly flush with the outside edge of the wheel.

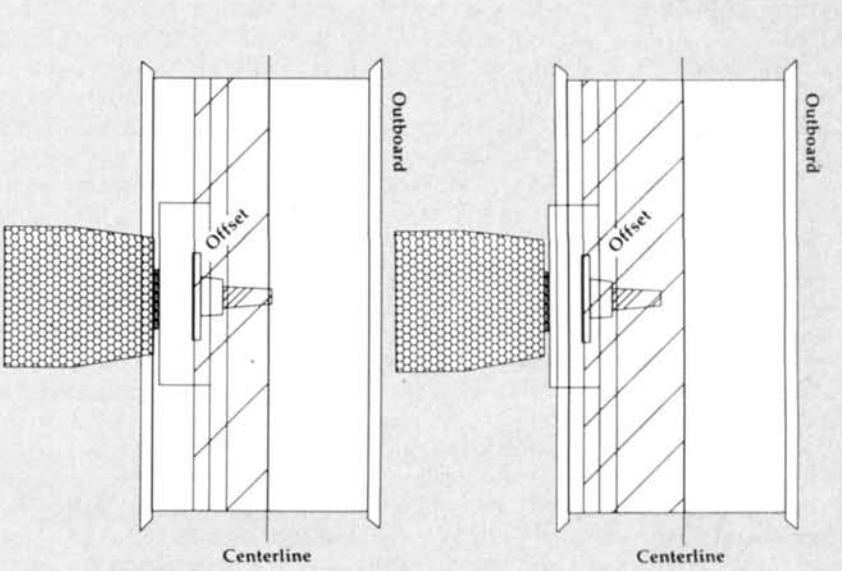


Fig. 2

With more positive offset, the wheel on the right not only gives a car a wider track, but it also puts more stress on the suspension system.

suggestion, his conversion used Blackfoot wheels, and the result was a right rear wheel that wiggled in any direction in which you nudged it. And while several car companies are working on active suspensions, infinitely random variable caster and camber is certainly *not* included in anyone's plans.

Here's what happened: The weight of the large wheel and tire, now centered over the axle portion of the rear shaft, hollowed out the bushing inside the hub. The bushing provides support and rigidity to the wheel, so once it had been worn away, the wheel wiggled.

There are two options available in wheel design: positive offset and negative offset (Fig. 1). A wheel with positive offset has the wheel-mounting point inboard of the center line of the wheel, while a wheel with negative offset is built with the wheel-mounting point outboard of the wheel's center line. No matter which scheme is used, the distance between the center line and the hub contact point is called the offset.

Generally speaking, the more positive offset (or the less negative offset), you have in a wheel, the wider the track will be. The track of any pair of wheels (front or rear) is measured from the center lines of the wheels, not from the outside edges of the tires, and a wider track usually means that your vehicle will be more stable.

But something else happens as well: As the positive offset is increased, the suspension geometry is changed, moving the center line of the wheel (and the thrust point of the wheel and tire mass) farther out onto the axle, which was never really meant to be a load-bearing mass (Fig. 2). When the wheel hits a bump, the force vector (the direction taken by the energy developed during the collision of two objects) moves the tire, which moves the wheel, and, in turn, moves the axle, the hub, the suspension arms and all the related suspension components. The axle acts as a lever and, if you've ever used a lever, you know that the farther you are from the object you're trying to move, the less the amount of force required to do the same amount of work. Also, the longer the lever, the further the end moves with any given amount of force. So in the case of our positively offset wheel, more force is applied to the axle and suspension system than there would be with a negatively offset wheel. The suspension is also being moved over a larger radius.

Bushing wear results gradually from the movement of the axle. However, if your axles move farther, the time factor is significantly reduced. If the wear factor of a bushing is 4 (that's not a real number, just an example) and the movement factor is 1, then the time factor is 3 (1+3=4). But if the movement factor is increased to 2, then the time factor would be reduced from 3 to 2 (2+2=4). When you increase the movement factor, the time factor decreases proportionally. To this, add the increased force of the longer lever, and you can understand why the bushings wore out so quickly on the young R/C fanatic's monster truck conversion.

(Continued on page 154)

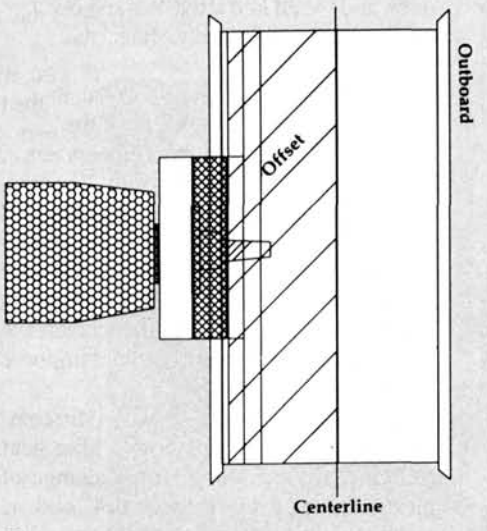


Fig. 3
The shaded wheel adapter has the effect of increasing the positive offset of this wheel.

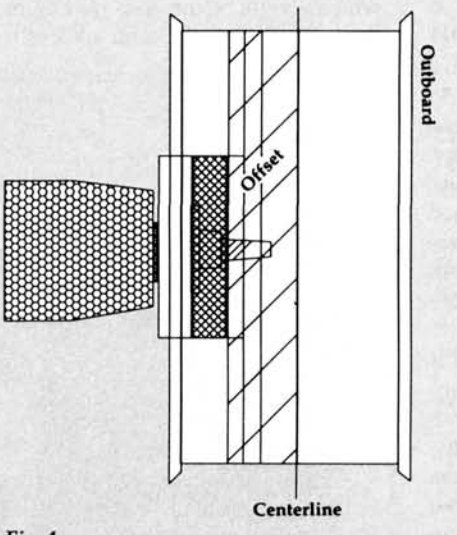


Fig. 4
Even with the adapter, the Wildebeest wheels didn't have much positive-offset effect.

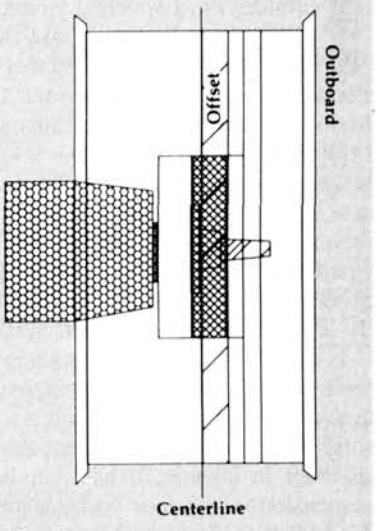


Fig. 5
The ideal solution for monster-truck conversions would be a wheel with some negative offset that would effectively produce no offset when mated to the adapter.

PHOTOS BY DICK BRINTON

BUDGET RACER

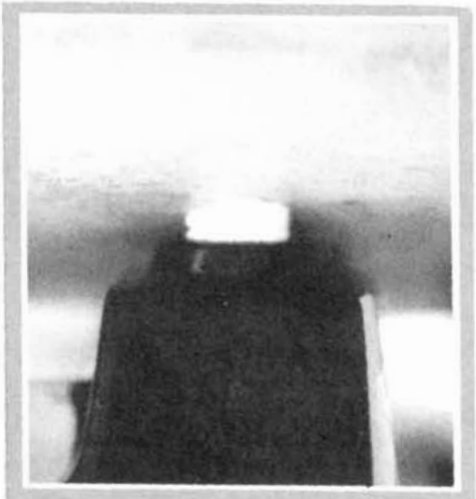
by DICK BRINTON

RAIDER...A NEW DEFINITION FOR "ENTRY LEVEL"

THE WEEK I received the Kyosho* Raider kit, I watched young Scott Hightower beat a 13-car field of RC10s, JR-X2s and Ultimas with a slightly modified Raider to take the A-Main in Production Class at Sacramento Mini-Wheels Raceway. Two weeks later, he did it again, so showing that his success was no accident. Scott is a very good driver, but even good drivers don't win against this kind of competition without good cars, and the Raider is the best entry-level off-road race car I've seen.

Is it perfect? No. But as we get into this series, I think you'll soon agree that it has tons of potential. The Raider has a good, solid design that will bring out the chassis-tuner in anyone. It has parallel-arm suspension on all four corners, just like the Indy and Formula 1 cars. Correctly designed parallel-arm suspension keeps the tire-contact patch (the part of the tire actually touching the track's surface) at its maximum, and this allows the tire to work better and produces the greatest traction.

The Raider weighs only 3.25 pounds, which is right on the class minimum. This is very good news, since excess weight means slower lap times. Even with the stock spring/damper units, the suspension movement measures 3cm at the front and 2.6cm at the rear (measured at the axle nuts). This is very respectable for any entry-level car and gives enough suspension travel to tune the car for a variety of track conditions.



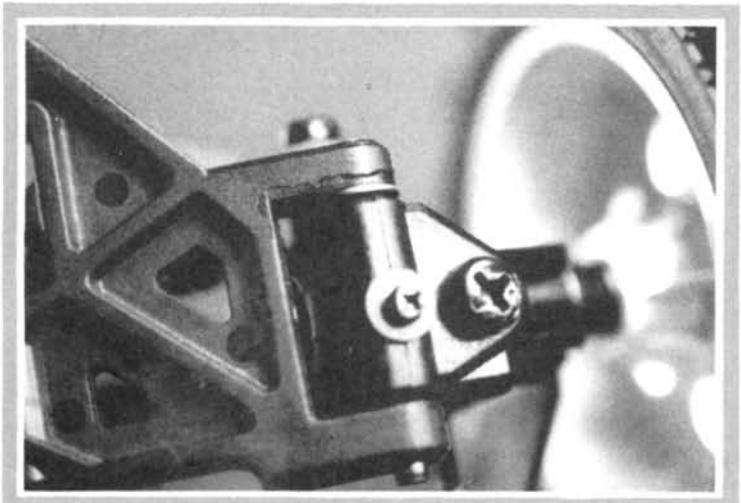
A wooden wedge has been installed under the wing, so tilting it up to increase downforce.

The battery is mounted at the bottom of the chassis to keep the center of gravity (CG) low, and this helps handling by reducing roll when the car enters a turn. A low CG also provides resistance to rollover, and we all know that the less our cars are handled by turn marshals, the more races we win.

To balance the weight of the motor, which is bolted to the left side of the transmission case, the design engineers offset the battery slightly to the right. This is a very nice touch and shows the kind of thinking that went into the Raider's design. In addition, if you race your Raider on an oval track, you can slide the battery toward the left side of the car to increase the car's "inside" weight bias and improve handling.

The Raider has a transmission/differential that contains a replaceable idler gear (provided). This, along with a change of pinion from 14 to 16 tooth (14-tooth is provided in the kit), can change the overall gear ratio from 11.6:1 all the way down to 9:1. Here's an inexpensive car in which you can easily change gears to suit the track!

The chassis and suspension arms come



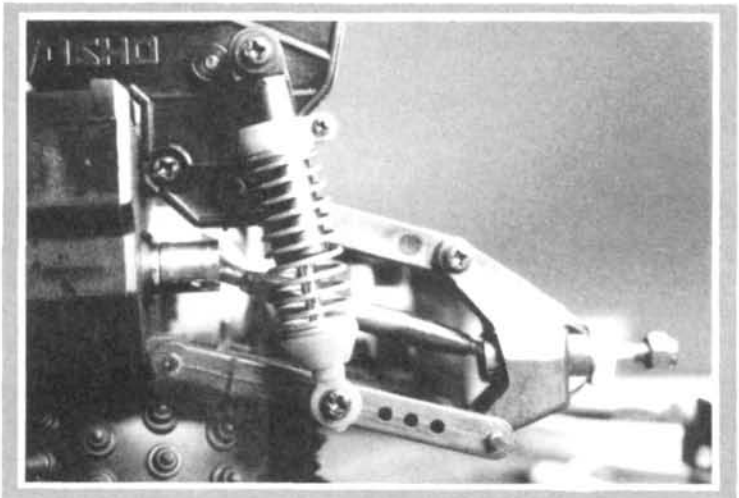
To remove the excessive play in the front suspension, a 3mm washer works well.

pre-drilled for optional spring/damper units. Not only that, but when you run on oval tracks, you can also change the ride height just by using a different hole to mount your shocks. This is yet another superb feature from Kyosho's design engineers.

On the down side, the instructions could be improved. The illustrations are very good but, since this will be the first car for many of those who buy it, more written detail should be added. For example, when following step 3, the M2x4 S/T screws are very easy to strip. This danger should be specified, and a cure should be suggested to help inexperienced builders. Further, the optional idler gear isn't mentioned anywhere, and some mention of which gear ratios work best for particular conditions would also be helpful. Like most cars, for correct handling, this car requires some toe-in of the front wheels, but the instructions just mention setting the wheels "straight ahead."

Here are the modifications I made to the instructions. Some of these will help you, even if you've already built your Raider.

• Instead of pulling the labels off the parts bags, cut the bottoms off the bags and then stand them upside-down. This way, the label will always be there to help you find a part, and you'll avoid a lot of confusion.



The rear lower arms come with additional mounting holes for ride-height adjustment or optional stock mounting.

KYOSHO

RAIDER

Type ..... Off-Road
Scale 1/10
Sug. Retail Price $119.95

DIMENSIONS:
Overall Length ..... 15.4 inches
Width ..... 9.8 inches
Height ..... 5.5 inches
Wheelbase ..... 10.2 inches
Front Track ..... 7.9 inches
Rear Track ..... 8.3 inches

WEIGHT:
Gross (w/bat.) ..... 52 ounces

BODY:
Type ..... Off-road buggy
Material ..... Polycarbonate

CHASSIS:
Type ..... Tub
Material ..... Plastic

DRIVE TRAIN:
Type ..... Gear
Differential ..... Geared

SUSPENSION:
Type (f/r) ..... Parallel arms
Dampening (f/r) ..... Friction

WHEELS:
Front: Type ..... One-piece plastic
Dimensions (DxW) ..... 3x.9 inches
Rear: Type ..... One-piece plastic
Dimensions (DxW) ..... 3.2x1.6 inches

TIRES:
Front ..... Treaded (stock)
Rear ..... Spike

ELECTRICS:
Motor ..... LeMans 05
Battery Required 6-cell
Speed Controller ..... Three-speed forward or reverse

OPTIONS AS TESTED:
Parma resistor speed controller, Pro-Line spike front tires.

COMMENTS:
The Raider offers beginning racers a car they can grow with. The mid-engine placement and the fully independent suspension system provide a hint of the car's potential.

BUDGET RACER

• At step No. 3, add a 3mm flat washer to the front suspension to remove play on the 30mm front suspension shafts. If you're going to race the Raider, use the optional (included in the kit) 32:21 idler gear instead of the 36:21 suggested in the instructions, because the stock setup is too slow for most tracks. In addition, when installing the motor, flop part R-8 (see instructions) and use the 12-15T hole and the slot marked on the cover, or holes B and F, as shown on the diagram at the top right of page 6, step 7, instead of the holes suggested in the instructions. If you drill a 5/16-inch hole in the transmission cover so that you can reach the pinion setscrew, you'll be able to change the pinions without removing the motor. (Removing the motor is quite a chore.)

• To keep dirt out of the transmission bearings, I cut off the ends of the sealing caps on some containers of Pacer's* Zap and used them to cover the ends of the shaft that supports the counter gear. Glue them on with silicone sealant so that they can easily be removed if necessary, but don't get any sealant in the bearings!

• Although the provided bushings are acceptable metal bushings, if you're going racing, install the Kyosho No. KYOC2201 H-006 ball-bearing set throughout. I did, and it makes *a ton* of difference.

• When cutting the antenna hole in the body, note that the measurement is 75mm, *not* 100mm.

• The wing incidence provided in the kit isn't correct. It looked as if it might even provide some lift, so I made it steeper by cutting small wooden wedges and installing them to provide the necessary tilt to the wing. This car really needs the additional downforce, and I might end up with a larger wing.

• The receiver was mounted in the stock position, but I used a layer of dense foam to cushion it. Those who fly R/C airplanes are always very careful to cushion the receivers against vibration, which can cause failure or glitching, and I think shock-mounting the receiver helps in off-road cars, too. It can't hurt!

• I installed a Parma* No. 11515 resistor speed controller, which provides brakes and is a good-quality trouble-free controller. I know some people can race *without* brakes, but I can't. *Never* use reverse as a brake, because transmission/differential gears aren't designed for that type of abuse.

PERFORMANCE: I headed down to our hot, new indoor track at Sacramento Mini-Wheels Raceway to test and photograph my Raider. Including the sales area, the Raceway totals 20,000 square feet, and the oval is 57x113 feet, as is the off-road track, which usually uses part of the oval and the infield. The on-road track measures 95x45 feet, and it has chemically etched concrete for a bite you have to experience to believe. There are 480 feet of benches, with power at each stand. When you're in the area, give Paul and Marge a call at (916) 383-4011, or bring your car and race.

When I first put the Raider onto the track with its stock front tires, the push was so bad that the only way I could manage the turns was by using the brakes to slide the rear end around. Push occurs when the front tires won't bite enough to turn the car. Pro-Line* No. 1018 front tires (the ones I run on my RC10) fixed the problem, because they're light and very effective.

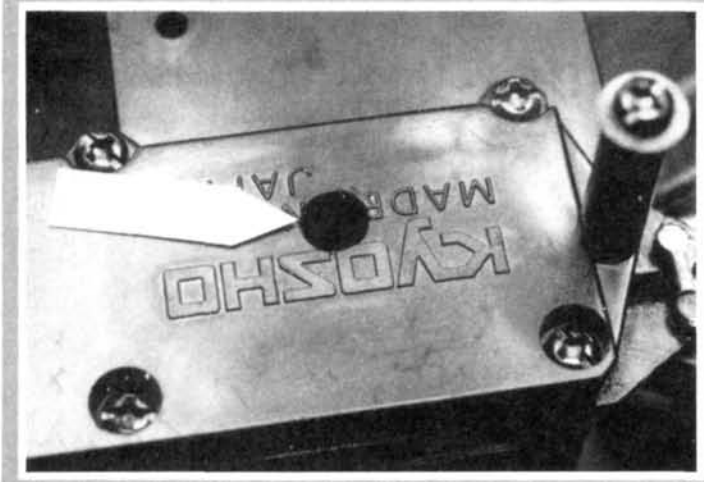
TEST RESULTS: The stock front tires are too hard, and they don't have the correct tread for dirt, though they work very well when driving on concrete or asphalt.

The rear springs are too stiff. With the Pro-Line fronts, the push vanished, and oversteer (read spin-outs) became the order of the day.

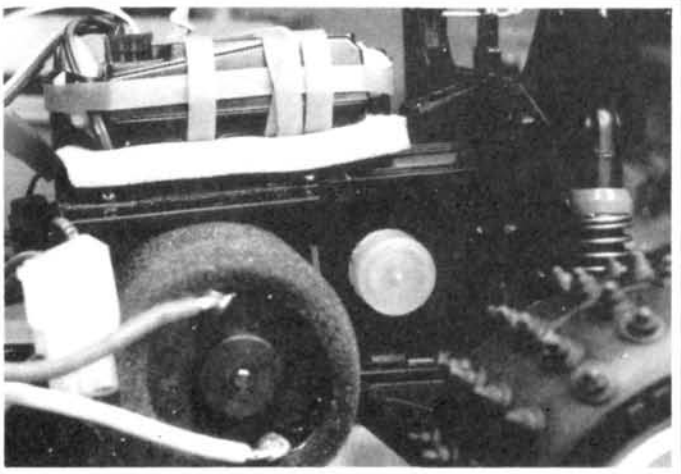
The stock friction shocks aren't up to the task. They work OK for back-yard running, but obviously can't compete very well against cars running adjustable oil-filled shocks.

The 15-tooth pinion, coupled with the 32:21 idler gear, was just about right for this track, and the LeMans 05 motor is

(Continued on page 158)



A hole has been drilled in the top of the transmission cover to provide access to the pinion setscrew. See text.



Shaft-end cover is made from pop-bottle cap; I added a foam cushion for the receiver, but the foam motor cover is provided in the kit.

TROUBLESHOOTING

by FRED MURPHY

LUNCH BOX TECH TIPS

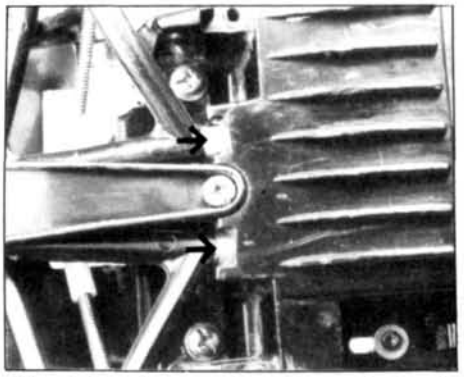
Tamiya's Lunch Box and Midnight Pumpkin inherited some weak spots from the Hornet.

THE MONSTER TRUCK CRAZE has swept the country, and along with this have come some cries for help. Owners of the Tamiya* Lunch Box and the Midnight Pumpkin complain about front suspensions becoming loose and about a slipping in their gearbox assemblies. Having compared the basic components of these trucks with those of other members of the Tamiya family, we've come up with some solutions.

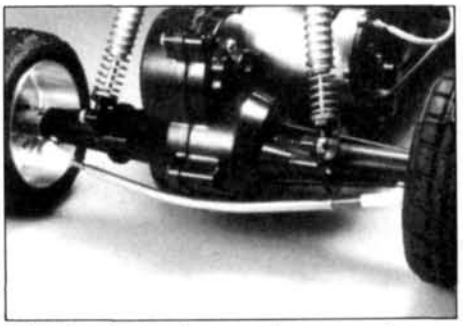
The front-suspension arms, the gearbox assembly and other components on these monster trucks are the same as those on the well-known Tamiya Grasshopper and Hornet. If you've never owned a Grasshopper or Hornet, you might not know about the parts on these cars that suffer the most from wear, and these parts also wear in the Lunch Box family of trucks.

Dirt and grit will accumulate where the front-suspension arms rest in their pivot points. With time, this dirt acts like sandpaper and wears down the ends of the suspension arms. This wear greatly increases the front-to-rear movement of the suspension arms, and this makes the steering and dampening action sloppy and noisy. You can either buy the Tamiya replacement-parts card that has these A-arm components on it, or you can beef-up the existing A-arms with a front A-arm steering kit from Miracle Speedway*.This kit contains a set of brass bushings that fit onto the ends of the suspension arms and eliminate any excess play in the suspension and in the steering. Be sure to check the steering tie-rods. Even though Tamiya has replaced the traditional Z-bend steering tie-rod ends with ball ends, the company still uses the same gauge of material for the rods. If the tie-rods are damaged, replace them with the heavy-duty tie-rod set that's available from a number of sources, including Miracle Speedway and Trinity*.

Eventually, the axles will develop an excess amount of side-to-side play and the gearbox assembly will start to slip. To date, the Bulletproof Differential kit from Miracle Speedway is the best fix I've found. It contains specially designed shims and bearings that will eliminate axle play. This kit will tighten axle side play and so prevent the slipping that results



Miracle Speedway produces A-arm pivot-point bushings that take the slop out of the front suspension.



The Miracle Speedway gearbox-strengthening kit prevents gearbox separations due to oversize tire stress.

from wear and the stress produced by the Lunch Box's oversize tires. In addition to the diff kit, Miracle also offers a gearbox-strengthening kit that has a dual function: It not only prevents gearbox separation, but it also acts as a skid bar under the gearbox. The bottom of the Lunch Box receives quite a pounding, and while the tub-style chassis protects the radio system, the gearbox only has its casing to protect it. With the Miracle Speedway strengthening kit, the gearbox is protected by a heavy bar that's installed underneath it and held in place with ball ends.

Standard Lunch Box kits include the usual Tamiya plastic wheel bushings. These bushings wear quickly on basic off-road cars, and the added weight and stress of oversize tires greatly increases this wear. Replacing the plastic wheel bushings with ball bearings not only increases performance, but also helps to prevent

(Continued on page 166)

PARMA'S

HEAVY METAL HORNET

PHOTOS BY LOUIS V. DEFRANCESCO

The bright blue shock/body mount is clearly visible under Parma's Chevy Stepside truck body.

MONSTER HORNET CONVERSION

by CHRIS CHIANELLI

FINALLY, A monster-truck conversion for the venerable Tamiya* Hornet. What took so long? Who knows? Parma* has only now introduced this new conversion kit, and naturally, it will work just as well on the Grasshopper. Since the Hornet's rear trans-axle and front A-arms are the same as the ones used on the Midnight Pumpkin and the Lunch Box, the Hornet conversion should prove to be a respectable 2WD monster truck.

The basic conversion kit will include: front shock-mount towers; front wheel adapters; front and rear body-mounting posts; instructions; and all the necessary hardware. I've been told that the retail price will be less than $30.

There have been rumors of a deluxe kit that will, of course, include all the basic kit parts as well as one pair of front shocks (shown), monster wheels and tires (shown) and some type of truck body (possibly a selection to choose from). These parts will also be available separately, as will the rear shocks, the end-bell "cool filter" and the heavy-duty steering kit. Watch for a full review, as soon as we get our hands on either kit.

Thanks to Parma, Hornet owners will soon be able to join the Monster Truck ranks.

The basic conversion kit will include:

- ***Front shock-mount towers***
- ***Front wheel adapters***
- ***Front and rear body-mounting posts***
- ***Instructions***
- ***All the necessary hardware***

Time to take those old Hornets and Grasshoppers out of mothballs!

**Here are the addresses of the companies mentioned in this article:*
Tamiya/MRC, *200 Carter Dr., P.O. Box 267, Edison, NJ 08818.*
Parma International Inc., *13927 Progress Pkwy., North Royalton, OH 44133.* ■

LETTERS

(Continued from page 16)

I'd like to join the crowd of voters who think that stock just ain't what it used to be. The motor builders produce "factory-tweaked" motors in an effort to sell more and make more money. Stock class was instituted to give low-budget racers a chance to be competitive with his or her peers. The quest for the buck has clouded their viewpoint.

It seems to me that ROAR has only a few options, and very little time in which to react. To restore equity in the Stock Class, we need to make the motors the same, the cars the same, or the drivers' knowledge the same. If all the young racers out there knew all the little tricks and tweaks that make a motor increase 5000 or 6000 rpm, there will be a smaller gap in lap count. The other option is to make all stock motors closed end-bell-type with a maximum advance of 16 degrees. A drop in the price ceiling would help keep technology to a minimum. Personally, I think that the batteries should be kept at a 1200mAh rating as well.

Our club has been going strong for four years now, and I'd hate to see this great bunch of guys and girls torn apart

Continued on page 82)

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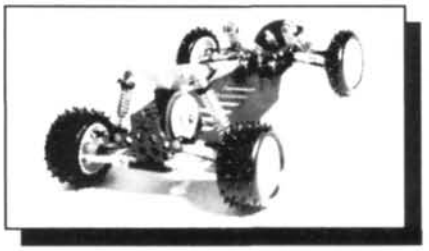

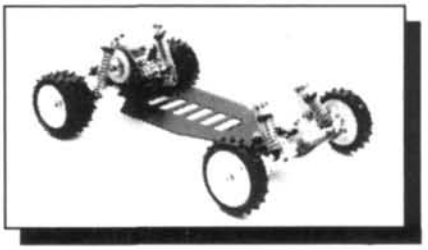

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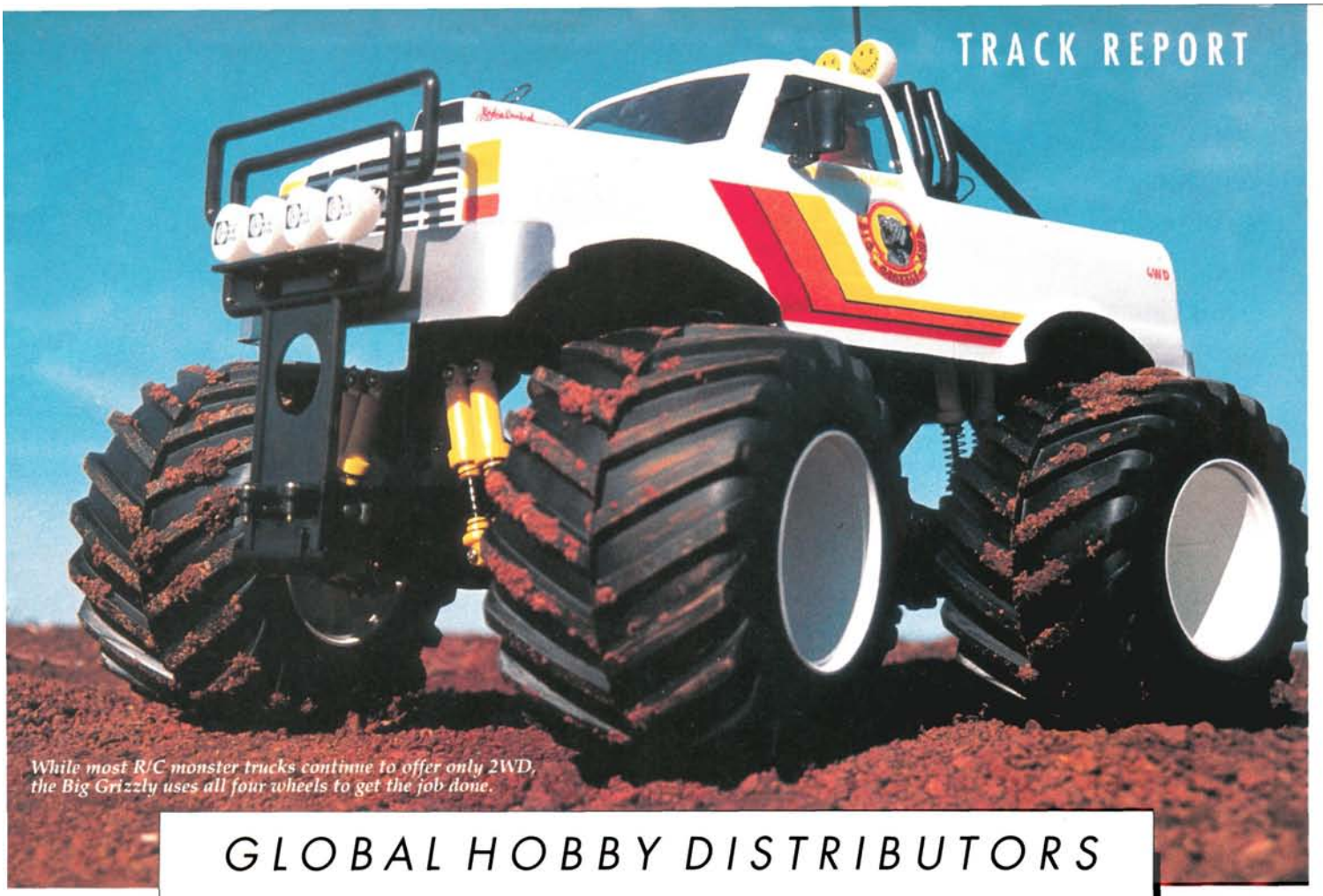


While most R/C monster trucks continue to offer only 2WD, the Big Grizzly uses all four wheels to get the job done.

GLOBAL HOBBY DISTRIBUTORS

BIG GRIZZLY

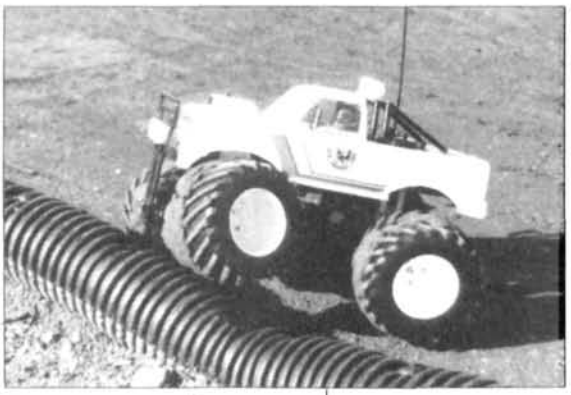
by FRED L. BEAVER

SOMEWHERE IN HIS DARK LAIR at the end of the coliseum, the huge beast waits. His captors can no longer contain him, and he is unleashed. With a low rumble, he moves slowly down the darkened tunnel until he appears, in all his defiant glory, before the assembled throng. The blaze of his yellow eyes shines as brightly as the sun, and his enormous flanks glisten. His muscles flex with the power of a thousand unchained horses. There before him cower the sacrifices of the night, helpless from his might: They can't run; they can't hide. With a deafening roar, the beast unleashes his fury and lunges toward his prey. With his four massive black paws, he pounces and pounces again, not stopping until his victims are pounded into the dirt floor and they are no more. His thirst for destruction sated, the beast circles the ring while the crowd roars its approval, and he disappears into the darkness whence he came.

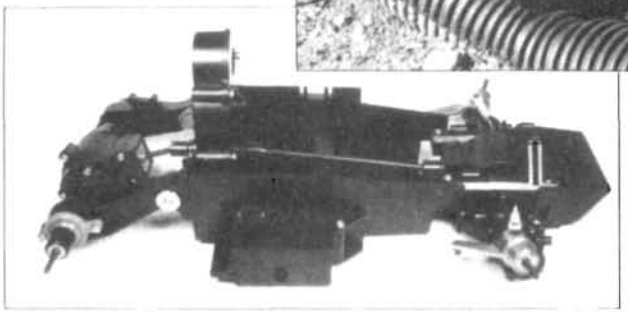
Anyone who has witnessed a monster truck event will recognize this scene. Not to be outdone, R/C has its own share of huge beasts and one of these is Varicom's* 4WD Big Grizzly, distributed by Global Hobby Distributors.

The aptly named Big Grizzly is 17 inches long, 11 inches high, and nearly 13 inches wide, with tires just a shade under 6 inches high. This behemoth is *big* with a capital B! An in-line Mabuchi 540S powers two large, plastic spur gears that are teamed to two torque shafts providing 4WD via

THE GRIZZLY NOW HAS A PRE-BUILT CHASSIS



When the Big Grizzly hits the off-road track, you don't have to worry about cutting the turns too short; just run over the barrier and then let the rest of the pack catch up.



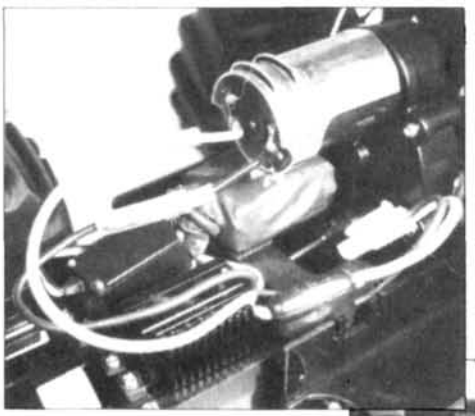
Left: Right out of the box, the Grizzly's major suspension components are already attached to the chassis—a real benefit to inexperienced builders.

metal ring-and-pinion gears, front and rear. The independent front suspension uses lower A-arms with metal uprights, while the live-axle rear suspension uses a pair of beefy trailing arms. Eight friction-type shock absorbers provide the dampening.

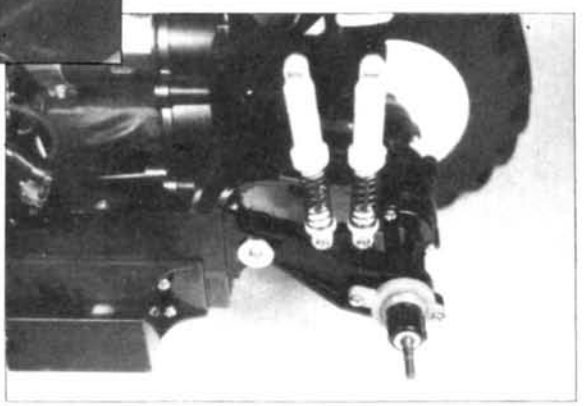
Some of you might recall that the original Big Grizzly was reviewed by Bill Landan in the April '87 issue of *RCCA*. The "new" Big Grizzly comes with a factory-assembled chassis and mounted tires; otherwise, the truck looks identical to the "old" Grizzly. The advantage to this approach is that the truck can be up and running in a much shorter time, especially if the buyer isn't experienced in assembling a fairly complex drive train. The disadvantage is that a more experienced buyer might want to install ball bearings or use a higher quality lubricant in the drive train, for example, and this would necessitate some disassembly.

The assembly manual still shows all 35 steps needed to construct the kit from scratch, but now you just have to follow the steps that are highlighted in blue. If you scan the manual, you'll note that about half of the overall assembly has already been done for you.

The coil-spring friction-type shock absorbers look very realistic and work well. There's a hard spring and a soft spring for each wheel, but unfortunately, the spring tension isn't adjustable. You could, however, substitute harder or softer springs, if the stock setup is inadequate for the conditions in which you drive. For the ultimate in trick setups, after-market,



Above: It certainly doesn't help the center of gravity when you mount the motor this high, but it does make it easier to install the radio equipment.



Right: Four coil-over shocks are used on the rear suspension. Trailing arms are connected to a solid rear axle.

VARICOM

BIG GRIZZLY

Type ..... 4WD off-road monster truck
Scale 1/10
Sug. Retail Price $199.95

DIMENSIONS:
Overall Length ..... 17 inches
Width ..... 12.75 inches
Height ..... 11 inches
Wheelbase ..... 10 inches
Front Track ..... 9.50 inches
Rear Track ..... 9.125 inches

WEIGHT:
Gross (w/bat.) ..... 6.9 pounds

BODY:
Type ..... Ford F-series pickup
Material ..... Clear polycarbonate

CHASSIS:
Type ..... Molded tub
Material ..... Plastic

DRIVE TRAIN:
Type ..... Spur gear/shaft
Differential ..... Bevel gear

SUSPENSION:
Front: Type ..... Lower A-arm
Dampening ..... Coil spring; friction
Rear: Type ..... Trailing arm
Dampening ..... Coil spring; friction

WHEELS:
Front: Type ..... Three-piece plastic
Dimensions (DxW) ..... 3.15x 3.5 inches
Rear: Type ..... Three-piece plastic
Dimensions (DxW) ..... 3.15x 3.5 inches

TIRES:
Front ..... Terra
Rear ..... Terra

ELECTRICAL:
Motor ..... Mabuchi 540S
Battery Type Required 6-cell
Speed Controller ..... Resistor

OPTIONS AS TESTED:
Futaba Magnum Sport radio system with MC112B speed controller

COMMENTS:
The Varicom Industries Big Grizzly is the least expensive 4WD monster truck available today, yet it's very tough and of good overall quality. Due to its complexity, buyers should have some prior R/C experience.

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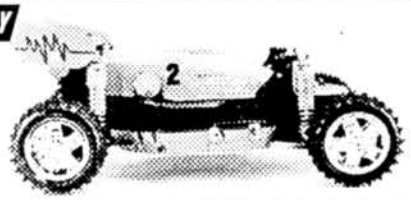

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BIG GRIZZLY

fully adjustable, oil-filled shocks (one for each wheel) could easily be retrofitted.

It's asking too much of the little "Maboochie" motor to drive the Big Grizzly in 4WD and turn over those huge tires. Only the Clod Buster's tires are bigger (but not much!), and the Clod Buster has *two* motors! Varicom ensures that the motor can be set up with different sizes of pinion gears, and they even include three pinions: 13-, 15- and 20-tooth. (No one will accuse the Grizzly of being fast, even with the 20-tooth pinion installed.) To be fair, in rough terrain, a stock 2WD truck would be left eating dust (or mud), but the only thing that will stop *this* monster is a stone wall!

It's a sure-fire bet that the stock, wound, resistor speed controller will be "smoked" before long, so don't even waste your time using it. Instead, get an electronic speed controller when you buy your radio gear,and mount it where the servo for the stock unit would have gone. As a precaution against large current draws that can damage a controller, install a 30-amp "flat"-style automotive fuse in line with the red wire that connects the battery connector to the controller.

The Grizzly's tires are hermetically sealed on three-piece rims. If the air inside the tire is squeezed out, e.g., after a particularly high jump, air can't get back in and the tire will have a flat spot. To remedy this, drill four holes of approximately 1/8 inch diameter, 90 degrees apart around the perimeter of the inside rim. Then disassemble the rim and drill two more holes (180 degrees apart) in the inner wheel ring and reassemble the tires and rims. After this modification, the tires will have much more "give," and this will also improve handling.

The Grizzly's body is modeled after the world's number-one-selling truck: the Ford F-Series pickup. The body is molded in clear polycarbonate (most truck kit bodies are injection-molded). Clear bodies don't usually have the minute detail found in injection-molded bodies, but they're lighter and they usually look nice longer. A clear driver figure is also included.

To give the truck a custom appearance, a colorful decal sheet is provided. Although the decal for the tailgate appears to be too large for the rectangular indentation molded into it, it isn't very noticeable once the decal is applied. If you paint your truck white, you should paint this indentation a dark color so that the white

(Continued on page 166)

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LETTERS

(Continued from page 75)

in an argument over battery ratings. We have some really great races, and I want this group to enjoy their hobby/sport for some time to come.

ROAR is holding the aces and needs to show its hand. Let's not ruin a good thing just for the sake of going a little faster. The modified classes are for those whose need for speed exceeds the capabilities of entry-level equipment.

RICK GONDECK SR.
Baltimore Rough Riders Off-Road Car Club

Issue Info

I'm a 17-year-old girl, and I have the Kyosho Assault. I'm pretty new at all this, so could you tell me which issue contains an article on this car. I love this stuff!

RENEE YACKLE
Rochester, NY

Renee, welcome to the world of fun stuff; you'll never be bored again! The original Track Report on the Kyosho Assault was in the Summer '86 issue of RCCA.
CC

DOUBLE DARE

(Continued from page 23)

of power from the Sprint pack, I ran the Double Dare full-open all the way around the field. The truck showed no signs of

(Continued on page 86)

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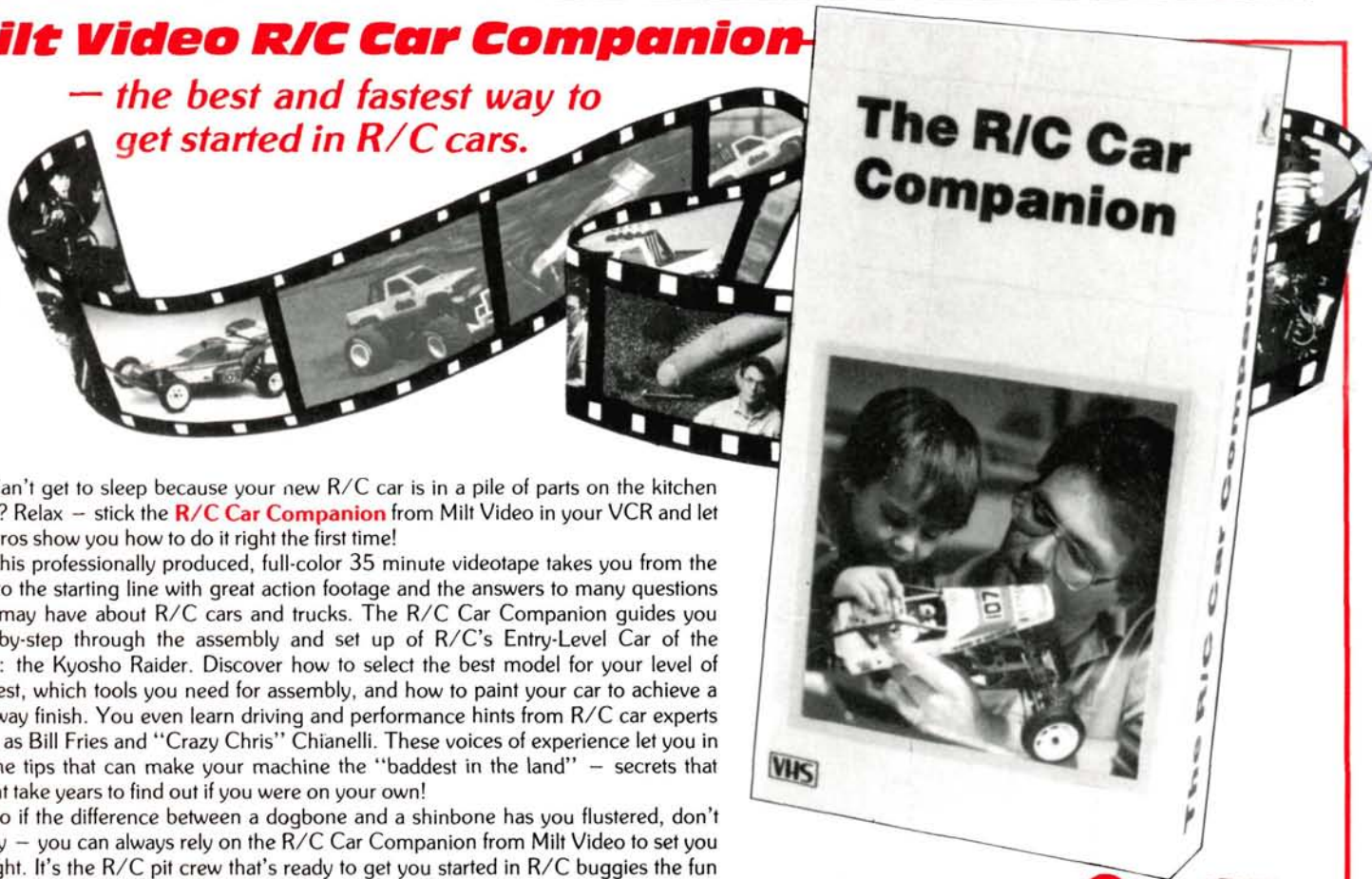

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SCOPING OUT

THE DIMINUTIVE DIALED RACING PRODUCTS DRP-306

by RUDY MEYER

SCOPING OUT: As we're committed to bringing you the most up-to-date technical information on R/C products, Radio Control Car Action now has Rudy Meyer, an accomplished electrical engineer, to test the newest high-tech electronic equipment that's flooding the R/C market. "Scoping Out" is a two-part test in which a product is first subjected to extensive bench testing using sophisticated equipment and then actually used in the field. These tests will allow us to expose any ridiculous performance claims and, at the same time, provide R/C car enthusiasts with invaluable information on where they should put their money!

THIS MONTH, I tested Dialed Racing Products'* DRP-306 electronic speed controller. The DRP-306 has the following features:

- Battery-elimination circuit
- Proportional acceleration and braking
- 306 amps continuous-current capability
- 960 amps peak-current capability
- Large selection of receiver connectors
- Small size

The battery-elimination circuit (BEC) allows the user to power his receiver and steering servo from the motor battery, instead of having to add an extra receiver battery pack, which takes up space and adds weight. This, as well as its size, makes the DRP-306 ideal for 1/12-scale models.

With proportional acceleration and braking, the modeler can adjust for the optimum interaction of the speed controller and car with the track conditions. On the DRP-306, both the rate and neutral pots are mounted below the surface of the top cover. The neutral pot is aligned to the hole in the cover, but the rate pot doesn't line up with its prospective hole. With the pots mounted below the cover, the racer is required to use an insulated screwdriver. The poor alignment of the pots to the holes makes it very difficult and time-consuming to find the slots in the pots.

The DRP-306 can be bought with these receiver connectors:

- Futaba*, J or G
- Airtronics*
- KO-Pro P*

The DRP-306 was tested on our standard test bed, which consists of: a 6V lab supply; an oscilloscope to monitor the output (making sure that at full throttle the speed controller is fully on); a digital voltmeter to measure the voltage drop across the controller; a motor to evaluate the braking capabilities; and a supplemental load to increase the motor current to 12 amps.

All speed controllers are tested with a battery voltage of 6 volts and a motor current of 12 amps. For this test configuration, the DRP-306 had a voltage drop of 0.13 volts and remained cool while operating at that current for 10 minutes. The voltage drop across the DRP-306 varies according to the motor load it has to drive. The voltage drop across the controller increases as the motor current increases, and decreases when the current decreases.

Alignment of the DRP-306 to the transmitter was difficult and poorly documented in the instruction manual. Adjusting the neutral pot (which was very sensitive) with the trigger in its neutral position gives you linear acceleration for trigger movement. For this setup, the braking rate was approximately 20 percent when the trigger is released and allowed to return to its neutral position. Adjusting the neutral pot in a clockwise direction increases the braking rate, but it also adds a lot of dead space to the trigger before acceleration occurs. When the neutral pot is adjusted counterclockwise, braking almost disappears, but acceleration occurs earlier in the trigger movement. Adjusting the rate pot counterclockwise turns the DRP-306 into a drag controller that's fully on with only a slight movement of the trigger. By turning the rate pot clockwise, the controller becomes less sensitive to trigger movement. For both of these adjustments, the braking rate remains the same.

The DRP-306 is a nicely constructed and well-designed unit, but it has several minor drawbacks. Its first drawback, which I also consider to be the worst, is

(Continued on page 170)

TEST DATA

Model	DRP-306

DIMENSIONS:

Height	.67 inches
Width	1.25 inches
Length	1.75 inches
Weight	1.4 ounces
Access to Controls	Fair
Ease of Adjustment	Fair

ELECTRICAL:

(Manufacturer's Specs)

Max Voltage	Not specified
Max Current	960 amps
Max Voltage Drop	Not specified
Continuous Current	306 amps

TEST PARAMETERS:

Voltage	6 volts
Current	12 amps
Voltage Drop	0.13 volts
Retail Price	$189.95

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DOUBLE DARE

(Continued from page 82)

decreasing in speed, even over the rough terrain, but when it began to slow after about 12 minutes, I knew it was time for a battery change.

In a matter of seconds, I popped in the freshly charged Speed pack and was off again. This time, I decided to check out the truck's cornering, jumping and climbing abilities. Because of the overly responsive 4WS setup, it took me a few practice laps to learn to steer the Double Dare accurately. This steering mechanism is sensitive to even the slightest turn of the radio wheel.

Now for some serious slaloming through the tight turns. Although it was very agile, the Dare did seem to roll over a bit more easily than some other trucks I've run, probably because its track is relatively narrow compared to those of other monster trucks. As for the double-shock system, it worked well on the rough stuff. Jump after jump, the truck landed flat-footed with only the slightest bounce. To test its climbing ability, I chose a 45-degree hill on the outskirts of the field. Even after 15 minutes on the Speed pack, the truck "gnawed" up the hill without hesitation. Finally, after about 18 minutes of running, jumping and climbing, the truck begin to slow down.

Before changing battery packs, I decided to inspect the truck to see if any

(Continued on page 92)

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JG OPTIMA TRUCK CONVERSION

IT'S A MID-MOTOR MONSTER

Whether going through mud or climbing hills, it's no problem for the Optima Mid Truck.

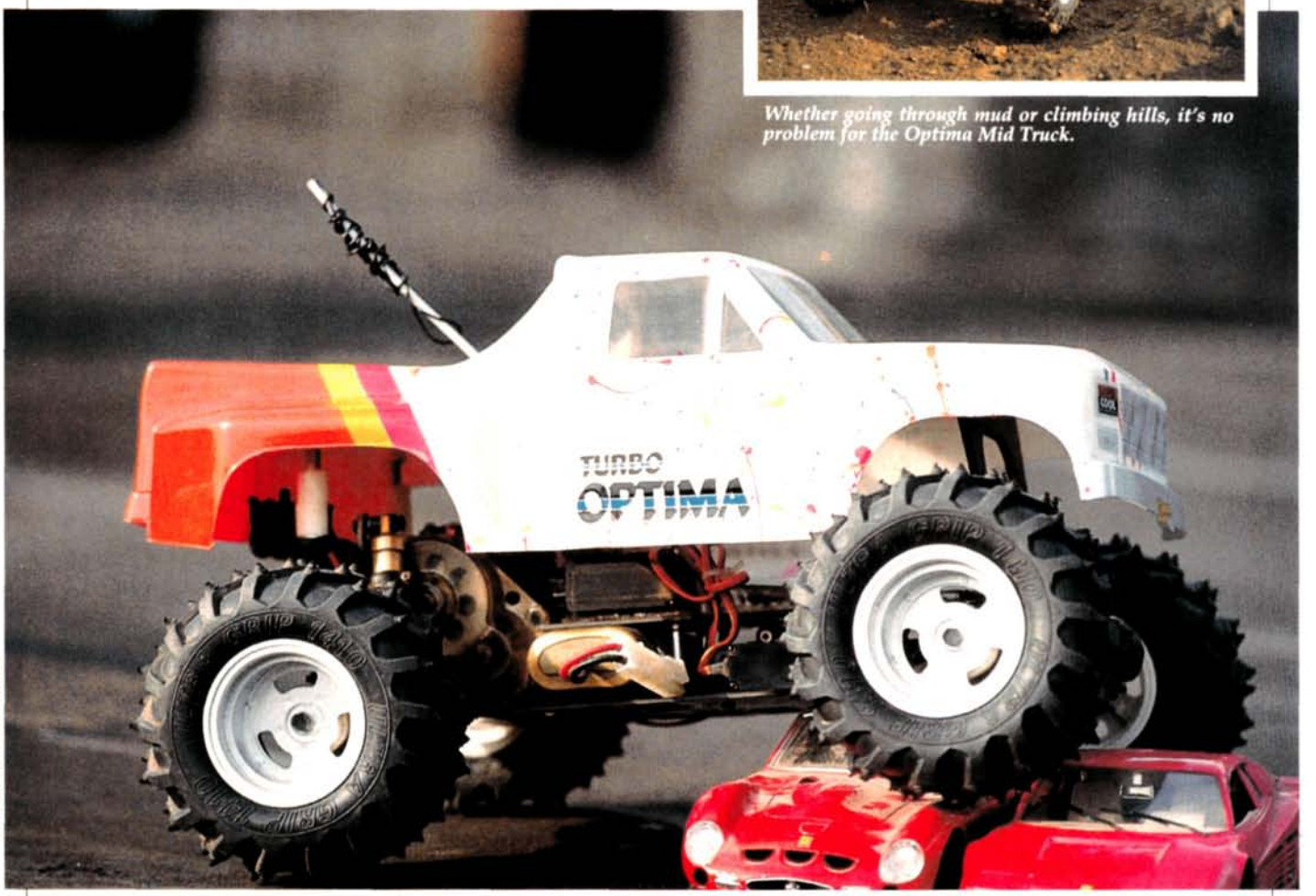


PHOTO BY BILL O'BRIEN

by BILL O'BRIEN

IT CAN BE frustrating to own an Optima Mid. It seems that in every magazine I buy, there's *nothing* about the Mid, but there's *at least* one article titled, "How to Convert/Modify/Mutate Your RC10." My Mid started looking like chopped liver in comparison, so when I finally saw JG Manufacturing's* ad for a monster-truck conversion kit for the Mid, I just couldn't pass it up.

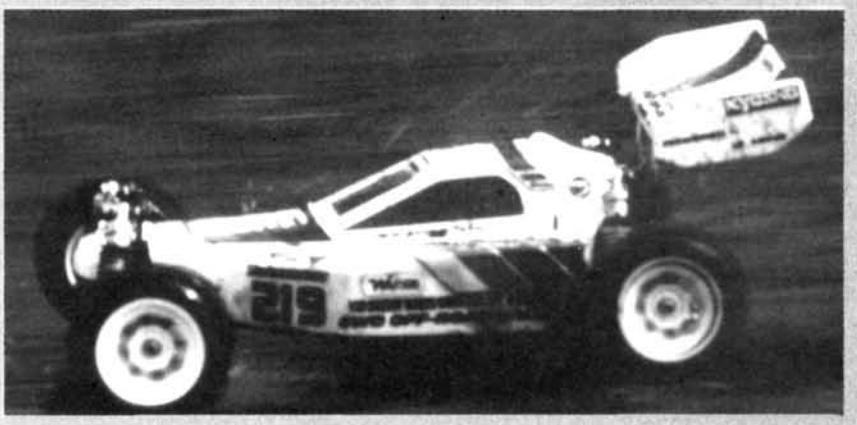
Surgery

Since I've already converted one of my Frogs into a truck, I knew the amount of work *could* be incredible, so I was surprised by the JG kit's simplicity. Actually, it was so simple that it frightened me, because it only contained four wheel adapters, two body mounts, four body-mount posts, some spacers and four pads to cushion the body against the mounting posts.

Adding the JG parts to the Mid was only a 15-minute job. An oval body mount was attached at the rear; the mounting posts and spacers added height; a taller, truck body mount poked up in the front; the wheel adapters were slipped on—and my Mid was almost a truck!

All I had to do was add a suitable body and, of course, the all-important wheels and tires. JG recommends that you use Tamiya* Blackfoot wheels. The wheel adapters in the JG kit provide the correct hub pattern, but because the Optima Mid is a 4WD car, it needs four Blackfoot rear wheels. Tamiya only sells Blackfoot wheels in front/rear pair combinations, so I thought I'd have to buy four pairs of wheels, which would leave me with several useless front wheels.

LURKING BENEATH THE MONSTER MID



AS THE BASE of the JG Monster Truck Conversion, the Optima Mid joins the ranks of other top-notch, high-performance cars that have undergone a transformation at the hands of "Mad Doctor" Gudvangen.

The Optima Mid is the only 4WD to have been given the "monster massage," and this is no mistake. In its original state, it has taken top honors on countless occasions at state, local, national and international competitions. The Optima proved its strength and performance potential at the IFMAR World Championships in 1987, when it took five out of the top 10 spots in the A-Main.

Even with the monster truck conversion kit installed, the Mid still retains its high-performance attributes, e.g., a toothed belt drive and front and rear differentials. The Mid's four-wheel independent-suspension system uses A-arms with adjustable upper links and oil-filled coil-over shocks that smooth out any track. While the low-profile tires are set aside for the conversion, the Mid still handles well because of its world-class suspension system.

If the monster truck racing scene becomes too routine and you need a change of pace, in roughly 15 minutes, you can again be driving one of the top 4WD contenders in the world!

Luckily, my Aristo-Craft* Wildebeest (a 4WD truck) was on the repair bench, and all its wheels have the same hub-mounting pattern as the rear of the Blackfoot. The center holes on the Wildebeest wheels were about a millimeter too small, but a round file fixed that in no time. I used a pre-painted body, also from JG, and my Monster Mid was born.

Performance

Lunatic that I am, I installed the truck parts on a modified Mid that already boasted a JG graphite chassis, Kyosho's* front one-way differential and rear ball differential, and Platinum shocks. I intend to *race* the truck, rather than do a lot of car crushing; if crushing had been my primary objective, I'd have switched back to the Mid's stock metal chassis. (A major asset of the JG conversion is that 15 minutes of assembly means only 15 minutes of *disassembly* to get the car back to off-road trim.)

The Platinum shocks proved to be too good for the truck! Everyone wants to show off a little, but the Platinums held the Mid to the ground so well that I could barely manage a wheelie. I could have left them on, because the truck was rock-solid in the turns, but as I didn't want to give up show biz, the standard Kyosho Gold shocks went back on. (Be careful when doing wheelies with a belt-driven car or truck. If you use the time-honored technique of blipping it into reverse and then adding full-forward throttle, you might stretch or snap the belt.)

Apart from a little body roll on sharp turns, the Monster Mid tracks well, and as it comes up to speed, the sound of the belt is very similar to the sound of a turbo charger winding up. Since I had to use a smaller pinion gear to compensate for the greater mass of the truck tires, the Monster Mid's speed is less than its speed as a car, but it runs as well as my Blackfoot—and it's still faster than my Bruiser.

What's Next

There are even more modifications for the Monster Mid: To keep down the motor load, I'll add the Robinson* 48-pitch spur gear and companion pinion gear suggested by JG (93-tooth spur, 17-tooth pinion). I've discovered another kit, also from Robinson, that adds adjustable toe-in and toe-out to the rear wheels of the Mid. After adding the toe-in kit and adjusting for two degrees of toe-in, the truck has a 1-foot turning radius. Try *that* with your Big Brute!

Only 15 minutes of work is needed to transform the Optima Mid into a truck. Notice the tall front and rear body mounts and the Wildebeest tires and rims.

Thanks to JG and Robinson, there's finally something for my Mid—and it's all great stuff! Only one question remains: What do I do with *six* trucks?

**Here are the addresses of the companies mentioned in this article:*
JG Manufacturing, *P.O. Box 6014, Whittier, CA 90609.*
MRC/Tamiya, *2500 Woodbridge Avenue, Edison, NJ 08817.*
Aristo-Craft/Polk's, 346 Bergen Avenue, *Jersey City, NJ 07304.*
Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
Robinson Racing Products, *501 Peach Lane, Santa Ana, CA 92704.* ■

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DOUBLE DARE

(Continued from page 86)

parts had become loose or needed adjustment. I found that a front steering arm was cracking away from the steering block, and sure enough, on the next run, the arm broke completely away. Aside from this weak spot, the Double Dare appeared to be fine, especially under the chassis tub cover, where most of the truck's vital organs reside.

The only other problem I've had with my Double Dare is that the front steering knuckle has broken twice in the short time I've owned the truck. My local hobby dealer tells me that five out of the 10 Double Dares he's sold have had this problem, so I hope that Kyosho is looking into it and will seek to correct it. Until then, I'll keep a couple of spare knuckles around for quick trackside repairs.

So if you're ready for the excitement of twin-motor mud madness, I dare you (or better yet, *double dare* you) to find a better double-trouble truck for the same (reasonable) price as the Double Dare. I'll meet you at the mud pits!

**Here are the addresses of the manufacturers featured in this article:*
Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
Model Craft Manufacturing, *3455 West 6th St., Los Angeles, CA 90020.* ■

CLOD BUSTER

(Continued from page 44)

up the difference in shock length. Each of the eight Kyosho shocks was filled with

(Continued on page 98)

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CLOD BUSTER

(Continued from page 92)

10W Robinson Racing* synthetic shock oil and equipped with the shock kit's lightest springs. This combination may sound a little light, compared to what you might use in an R/C *car*, but when you're using two shocks on each wheel, it makes a *big* difference.

While the shock kits came with everything you'll need for assembly, there's no mounting apparatus (i.e. bushings or pivots) on which to install the shocks. This means that you must either order the hardware *with* the shocks, or find a method of attaching them yourself. Fortunately, I had some extra RC10 shock-mounting hardware, and this fit the Kyosho shocks.

With all the suspension components now back in their original locations, I flipped the truck over to install the suspension braces that span the two suspension arms, front and back. After installing the braces, I found that they limited the independent action of the suspension. While this could be of help to sled-pullers, where any extra support is useful, it isn't what you're looking for when running off-road. You don't want anything to curb the action of your suspension when you encounter uneven terrain. These are better left aside until it's time to hook up to a pulling sled. With the installation of the ESP accessories completed, I just had to mount the body and attach the wheels.

As you can see, the original pickup body was scrapped in favor of a sparkling Corvette body from Motion Graphics*. Motion Graphics will paint almost any

(Continued on page 106)

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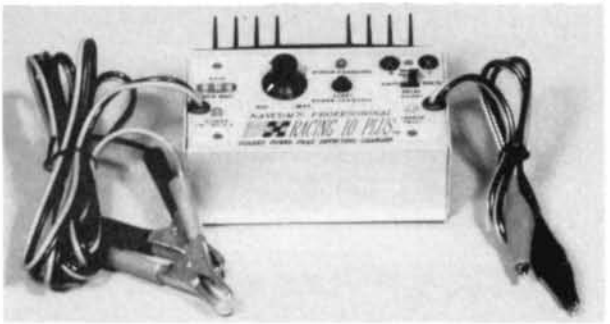

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Track Report
SECOND LOOK SERIES
BFGOODRICH
Driver: Ramblin Ron
BLACK FOOT
JAKES MOTOR SPORT

The BLACKFOOT Rocks!

by CHRIS CHIANELLI

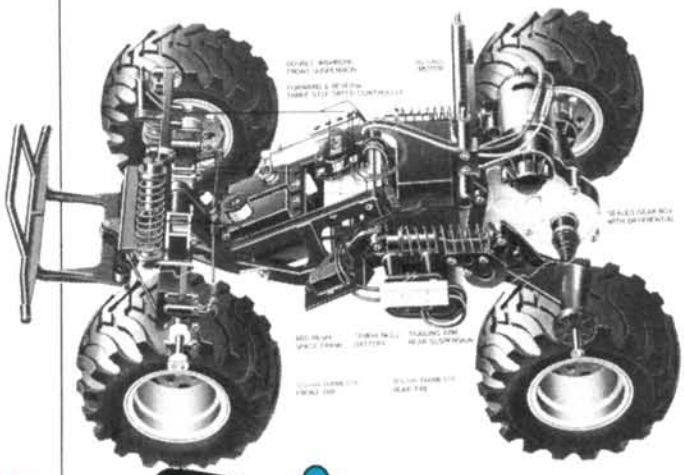
AS YOU CAN see from the photos, there are a number of beauties pictured here that were all born to rock and roll! But the rock and roll machine we're going to focus on for the time being is the MRC/Tamiya* Blackfoot. So, monster maniacs, listen up! I'm sure we all agree that R/C "terra-terrorizing," in *all* its forms, is great. Nevertheless, to some of us mud-stompers, nothing beats doin' the monster mash with a favorite truck, and when it comes to great looks and low maintenance durability, the "FOOT" steps out with the best of them.

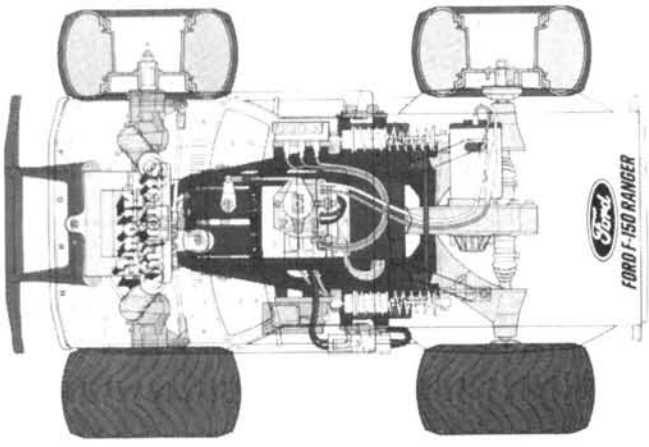
The Tamiya Blackfoot Ford F-150 Ranger, although a completely new offering in the monster truck category, incorporates many of the time-proven features found on other Tamiya cars to make the Blackfoot one of the most trouble-free, rugged R/C cars I've ever tested. After many jumps, head-on crashes into curbs, high-speed end-over-end flips and flat-out disagreements with bolders, the Blackfoot has sustained no damage, save minor scrapes to the finish, and has needed no repairs or even adjustments since initial assembly, none! To be more concise, the FOOT is built for non-stop jammin'.

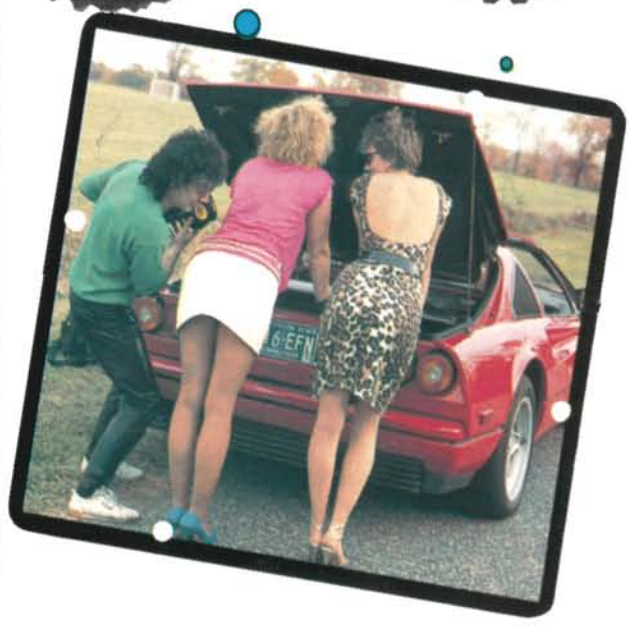
Photos by Louis V. DeFrancesco, Jr.

Above: The Blackfoot in the groove. Below: Chassis detail shows use of some time-proven, durable Tamiya components. Below right: The end.

THE KIT. Starting at the front, heavy upper and lower swing arm links pivot off thick gauge aluminum suspension stays, making for a near bullet-proof front end. The bright red cross-braced ABS resin chassis halves are similar in design to those used in other Tamiya cars, as is the resister type three-step forward and reverse speed controller. Incidentally, battery eliminator circuitry is also included, but the instructions illustrate setup with or without the BEC. The differential is of the automotive type with metal planetary and bevel gears. Take note there are left and right beveled gears, so don't mix them up. Other niceties to be found are a trailing arm rear suspension, ball bearings for the splined output short shafts (a complete set is available), half-shaft rubber boot dust covers, a Mabuchi RS-540S motor, and an accessory pack with four-way box wrench, liquid thread-lock, grease, and switch conductive lubricant to name a few.







BLACKFOOT UPDATE

by FRED MURPHY

NOW THAT YOU'VE had a chance to race, crush and pull with your Blackfoot, you've probably noticed its deficiencies. As I'm sure you know, the heart of the Blackfoot comes from the ever-popular Tamiya* Frog. The frame rails, front-suspension arms and gearbox originally belonged to the Blackfoot's little off-road buddy, and they worked quite well in that application. However, on the Blackfoot, the added stress and strain caused by monster tires and increased weight rapidly wears out these components.

Both the steering and the front suspension show signs of wear much earlier than on the Frog, and this calls for the same beefing-up techniques that were written up in the previous Frog articles. The most critical of these hop-ups concerns the suspension arms. By replacing the stock suspension arms with CRP* suspension arms that have factory-installed brass bushings, looseness in this area will be eliminated, and future wear will be kept to a minimum. The Blackfoot's steering blocks should also be checked frequently. Because the oversize tires subject the stock blocks to extraordinary pressure, the blocks can be very easily damaged. Companies like Parma International* offer good replacement steering blocks that are economical and durable. In addition to the steering blocks and the suspension arms, you can round out your front-end beef up with a heavy-duty steering-rod kit.

The Blackfoot has the same gearbox as the Frog, and, once again, with the added stress of oversize tires, the stock gearbox assembly is quickly pushed to its limit. If you intend to race or pull with the Blackfoot, this gearbox assembly *must* be beefed up. Thorp Manufacturing's* Dirt Burner differential replaces the stock planetary gear and half-shaft differential with a fully adjustable ball differential and heavy-duty half-shafts that will suit any application. If you want to get the most from the Blackfoot, you *must* improve the gearbox.

The suspension on the Blackfoot is suitable for general use, but changes need to be made if you want more shock travel and adjustability. J.G. Manufacturing's* hop-up suspension kits solve this problem. These kits allow you to mount RC10 or Kyosho* Option House shocks, which are crucial for racing and a real plus for all other monster-truck activities.

The Blackfoot is a big hit on the monster-truck scene, and with a few improvements your Monster will be monstrous—especially to other trucks on the block!

**Here are the addresses of the companies mentioned in this article:*
MRC/Tamiya, *200 Carter Dr., Edison, NJ 08818.*
Custom Racing Products, *3250 El Camino Real B-3, Atascadero, CA 93422.*
Parma International, Inc., *13927 Progress Prkwy., N. Royalton, OH 44133.*
Thorp Manufacturing, *P.O. Box 6014, Whittier, CA 90609.*
J.G. Manufacturing, *P.O. Box 6014, Whittier, CA 90609.*
Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, Il 61820.*

■

ASSEMBLY: Tamiya's instructions are so complete and accurate that it's a mistake to deviate even a little. The assembly sequence is well described, and if a part or a screw doesn't *exactly* match the to-scale picture in the parts column, you can be sure that you have the wrong part!

When I assembled the friction shocks, I paid no attention to the spring size and soon found that the right front suspension was much stiffer than the left. The rear springs are slightly heavier than those on the front, and they *should* be. I matched all four springs according to the instructions, and this gave me two front springs and two very slightly heavier rear springs. The difference was miniscule, but accurately noted in the instruction booklet.

There are 39 detailed steps to follow, and I completed my Blackfoot in nine hours. Don't be alarmed if you have a few parts left over. As I've already said, some of the Blackfoot components can be used on other Tamiya cars, so the extra parts on the parts tree were never meant to be used on the Blackfoot.

To illustrate the colorful model you can achieve *sans* brush, I didn't use paint on this kit. From the smoked windshield to the red undercarriage, what you see is what you get. As you can see from the photos, with its yellow wheels and bright decals, the 'Foot really stands out. Of course, if you prefer, red taillights, yellow parking lights, and silver door handles could be added, but who'd really notice them on such a brilliantly colored truck?

PERFORMANCE: With its 5-inch monster wheels, substantial ground clearance, smooth differential, Mabuchi RS-540S motor, light weight, undercarriage skid plate, and high-flex servo saver, you'd suspect that the Blackfoot is ready for the badlands—and it is!

Known as the "Abuse Master General," Publisher Louis DeFrancesco Jr. certainly lived up to his name during the photo session. Multiple jumps off 2-foot ledges, hill climbs, rocky roads, tumbles down the hills, and continuous running in soft sand (which the 'Foot handled very well with its large paws) were the prime directives of the day. Much to my surprise, the truck also tracked very well on pavement. If you intend to run your truck on pavement often, go with a reduced steering rate and make sure you have a couple of degrees of toe-in, just as you would with off-road use.

As I've already mentioned, the Blackfoot has needed no adjustments since assembly. The truck is t*ough*. So, if you're the type who loves to "rock" with the mud and "Stones," the Tamiya Blackfoot is definitely for you.

**Here's the address of the company featured in this article:*
MRC/Tamiya, *P.O. Box 267, Edison, NJ 08818*

■

TAMIYA

BLACKFOOT

Type ..... Off-road monster truck
Scale 1/10

DIMENSIONS:
Overall Length ..... 7 3/4 inches
Width ..... 11 inches
Height ..... 10 5/8 inches
Wheelbase ..... 9 5/8 inches
Front Track ..... 8 5/8 inches
Rear Track ..... 8 5/8 inches

WEIGHT:
Gross (w/bat.) ..... 5 pounds

BODY:
Type ..... Ford F-150 step-side
Material ..... Injection-molded plastic

CHASSIS:
Type ..... Perimeter frame
Material ..... ABS plastic

DRIVE TRAIN:
Type ..... Direct spur gear
Differential ..... Bevel gear

SUSPENSION:
Type (f/r) ..... Double wishbone/ Trailing arm
Dampening (f/r) ..... Coil spring

TIRES:
Type (f/r) ..... Terra
Dimensions (DxW)(f/r) ..... 4 3/4x2 1/4 inches

ELECTRICS:
Motor RS-540S
Battery Type Required ..... 6-cell flat, 7.2V, 1,200mAh
Speed Controller ..... 3-step w/remote resistor

COMMENTS:

The Blackfoot remains one of most popular monster trucks. It's fast, it has a wealth of after-market parts, and its ABS Ford F-150 body is quite attractive, even before painting. The weak differential and half-shafts have never been corrected, and even seem to have become worse, metallurgically, during the production run. Thankfully, there are good after-market solutions to the problem.

SECOND-LOOK SERIES BUYER'S GUIDE

An impressive flood of after-market parts has followed the great success of the Tamiya/ MRC Blackfoot, and many of these parts may be used to address the inherent weaknesses of this monster truck. Whether you need suspension components, drive-train accessories or bodies, your choices seem endless. Here are some of the parts you might want to consider.

Heavy-duty nylon steering blocks from Parma are direct replacements, and they're able to absorb the toughest terrain without breaking.

Kyosho Option House shocks are completely adjustable for any track conditions. A great compliment for the JG upright shock mounts.

CRP suspension arms, with factory-installed bushings, take the excess play out of your front suspension and eliminate poor steering response.

The Thorp "Dirt Burner" differential ends gearbox destruction. As in the Frog, heavy-duty steel half-shafts prevent stripping and slipping under big tire stress.

For Chevy fans, Parma offers a tough, Lexan step-side body that's a perfect replacement for the Blackfoot body.

RCRC Dog Bones are made of special lubricant-impregnated materials to wear better than stock units.

Race Prep's five-point rear drive hubs allow you to replace the stock units without having to buy parts you don't need. These hubs fit both the Blackfoot and Hornet.

The Thorp Dog Bone Conversion will reduce wear while adding the finishing touch to the "Dirt Burner" diff.

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CLOD BUSTER

(Continued from page 98)

polycarbonate body with some of the most brilliant colors and schemes imaginable. Although having a body painted like this costs more than an average pre-painted body, the results are justification enough when you want to look your best.

Although I didn't like the idea of putting holes through the body to mount it, I didn't have time to fabricate a Velcro mount, so I went with a set of BoLINK* 2-inch body posts. The posts were installed in the mounting holes that held the original posts, then the body was marked from the underside to indicate where the holes would be needed. When you drill the holes in the body, protect the paint from underneath with some type of tape. Simply place a piece of tape over the hole from the bottom side, and trim the area where the body mount passes through. If you don't, when the body moves even slightly on the post, it will wear off some of the paint.

Now, to get my Super-Vette trackside I just had to install the wheels. Fitted with the original Clod Buster tires, a set of Sees Machine* aluminum wheels was bolted onto the axles. Although I've seen a lot of aluminum wheels for a variety of applications, I've never seen such a remarkable machined finish and overall quality in a wheel. After a quick rub with metal polish, the wheels are bright and when the last wheel nut had been tightened, we were on our way to the beach.

Now clad in Corvette drag, with a sinister appearance that was in sharp contrast to its original docile pickup body, Project Clod Buster took to the beach. Owing to

(Continued on page 108)

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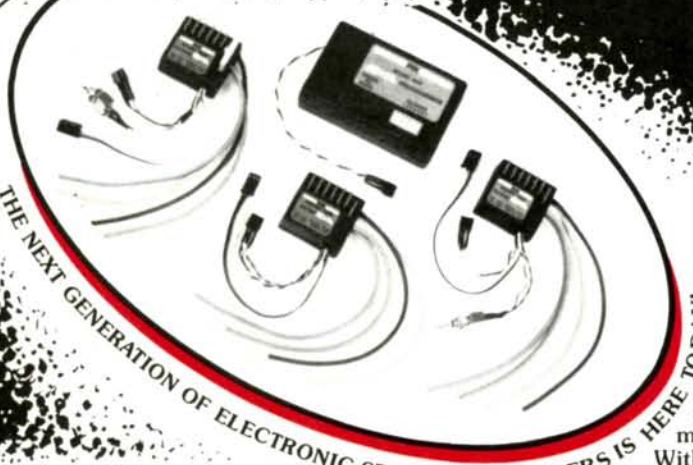

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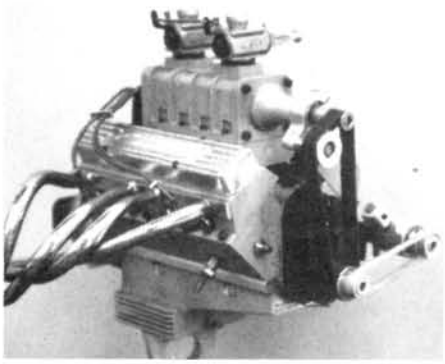

The Conley "362" is the world's smallest production model V-8, and is now available in a *rough casting* kit. With the use of a Bridgeport Milling Machine and a lathe you will be able to machine the kit-provided material into a working V-8. Items included in the kit: castings (block, valve covers, pan heads, and intake), piston rings, water pump, timing belts and pulleys, camshaft lobes, injection-molded parts, wristpins, crank pins, 95% of the required metal, valve springs, screws, taper pins, dowel pins, Loctite, O-rings, and blueprints. The engine has a bore of .750 and a stroke of .625 which gives a total displacement of 36.2 cc or 2.2 ci and weighs approximately 5 lbs. It measures approximately 6" long, 4" wide, and 7⅛" to the top of the carbs (when optional supercharger housing is used). There is an operating rpm from 2,000 to 12,000. Perfect for ¼-scale cars and boats.

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CLOD BUSTER

(Continued from page 106)

its massive tires that seem to float across the sand, the Clod Buster is more at home on this type of terrain than any of its other stable mates. With just these few modifications, I didn't expect a great deal more than what the truck was capable of doing straight out of the box, but I was mistaken. While handling wasn't very different from its stock state, it executed each maneuver at almost twice the speed. When combined with the Novak 1X, the punch delivered by the Trinity motors was a substantial improvement, to say the least. And with the new oil shocks, the Clod was considerably smoother in the bumps. While there was still some bounce from the huge tires, the Kyosho shocks all but eliminated the "hop" produced by the Tamiya spring "dampers."

If you're the proud owner of the world's baddest monster truck and feel compelled to give it a dose of nitro, the modifications outlined here will certainly fuel the fire.

**Here are the addresses of the manufacturers mentioned in this article:*
Tamiya/MRC, *200 Carter Dr., P.O. Box 267, Edison, NJ 08818.*
Novak Electronics, Inc., *128-C E. Dyer Rd., Santa Ana, CA 92707.*

(Continued on page 128)

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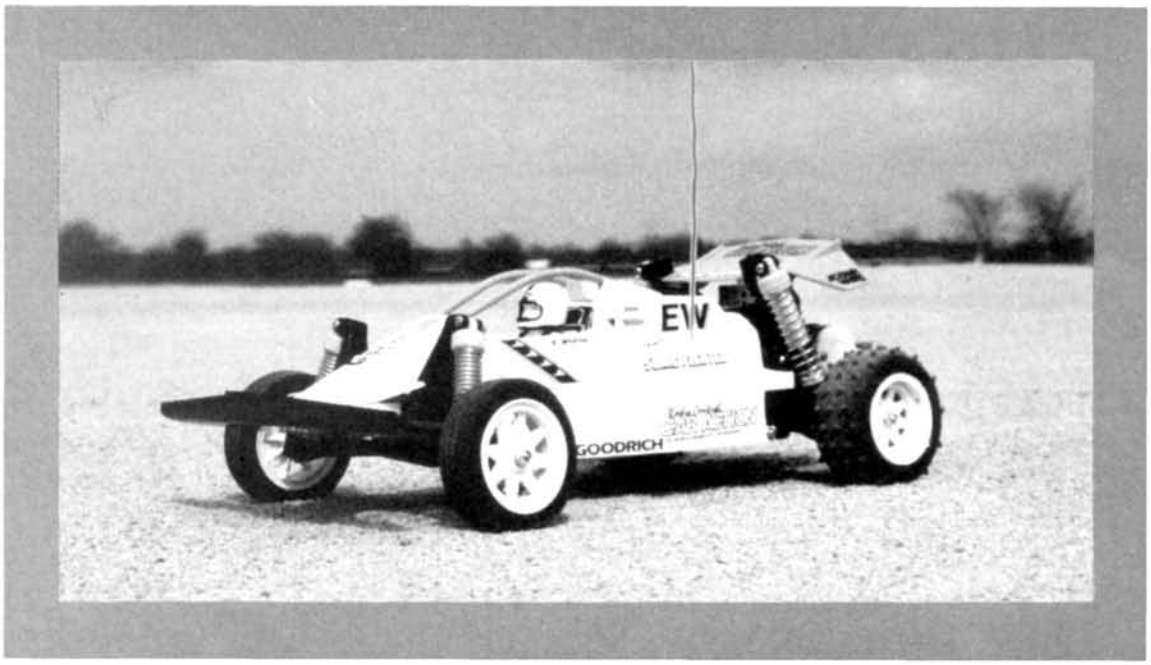


REINFORCING A WEAK SPOT

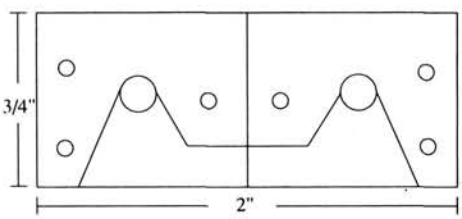
by TONY GULOTTA

EVERY ONCE IN A WHILE, a company with a great reputation for producing quality products will manufacture a model with a major design flaw. If you own a Tamiya* Striker or Sonic Fighter, you probably know what I mean.

While these cars are basically good entry-level vehicles, a serious problem with the chassis design could put your car down for the count and keep Tamiya in business making replacement chassis. Since the cars use identical chassis, I'm sure more than a few of you Striker/Sonic Fighter owners have experienced the same problem, so this one's for you.

The weakest points of the chassis are just behind the front end, where the tie rods connect the servo to the steering blocks. If your car comes in contact with anything harder than a pillow, the chassis will probably break in this spot. You can repair a minor crack with CA, but this will result in a brittle joint that will only split again, and other types of bonding agents just don't seem to work on the ABS plastic.

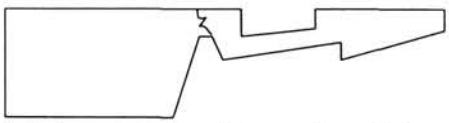
For a sturdier "fix" while you're waiting for replacement parts, you can repair the break in your chassis with CA, then make braces out of a scrap ABS parts tree, place them across the break and extend them along the chassis. Roughen the chassis with sandpaper, sand the parts tree flat, and CA it into place. This works well, but only for a while: Racing a car with a cracked chassis will throw off your alignment so badly that all the trim adjustment in the world won't make the car run straight. What's worse, your entire front end could pop out of its mounts and fold under. Talk about getting "squirrelly"! Not only is it expensive to replace the chassis every time it cracks, but it also creates a lot of downtime, because you have to take *everything* out of the cracked chassis and put it into a new one. Wouldn't you rather be racing?



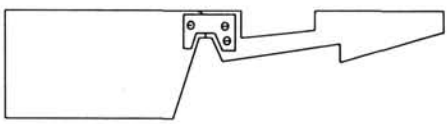
By following the steps outlined in the article, a single mending brace is all you need to keep your Fighter on the track.

With minimal expense, I solved the problem by using some common items from the hardware store. First, take a flat, zinc-coated 2x3/4-inch mending brace and size up its two pre-drilled holes with the curve of the chassis opening. Cut the brace in half and stick it into place on the chassis with double-face tape to trace the shape onto the brace from the underside. Remove the brace, cut off the excess material, file down the sharp edges and put it back on the chassis with more tape. Measure the thickness of the brace and chassis to determine the size of the screws and nuts you'll need to secure the brace to the chassis. (I used 2x6mm screws and 2mm nuts for mine, but you can substitute 2x8mm screws, if you use washers.) Drill three No. 46 holes through the steel and the chassis simultaneously. Position the holes so there's enough room for the

(Continued on page 126)



This is the point at which your Sonic Fighter chassis is most likely to break, but Tony Gulotta has come up with a cure.



With the brace screwed in place, the chassis is ready for the reattachment of the suspension system.

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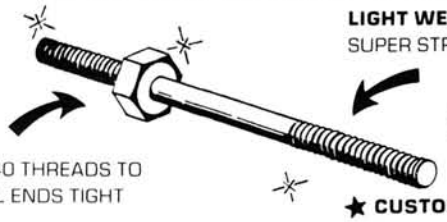

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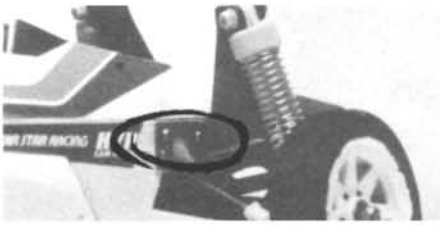
SONIC FIGHTER

(Continued from page 122)

hardware to clear the upper shock-tower mounting slots inside the chassis frame. Make sure that the screw doesn't stick out too far from the nut's surface, because it, too, could interfere with the shock-tower mount. In its three-piece wheel sets, MRC/Tamiya often supplies the small metric hardware you'll need, but you can use 4-40-thread screws and nuts instead. Just drill more closely to the ends of the brace, cut the screws a hair longer than needed, and use washers where necessary. If you thread the nuts onto the screws *before* you cut them, it helps to re-form the cut threads when you remove the nut.



The brace is barely visible behind the shock tower. It's a good idea to install this brace even before your chassis breaks or cracks.

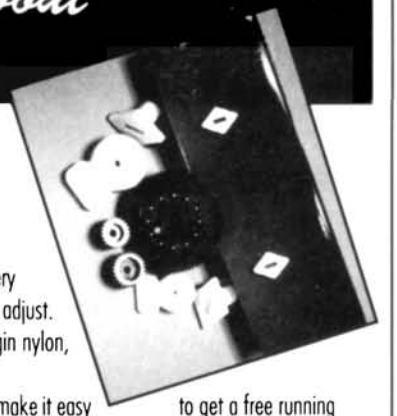
Next, remove the tape, position the brace, thread the screws through the holes and tighten the nuts. You might have to do a little trimming inside the chassis to make the nuts sit flat, but if you position the holes carefully, you'll avoid this. Finish the job by applying a drop of CA or thread-lock on the nuts to prevent them from vibrating off. I added a piece of sheet metal to the underside of the chassis front end to beef it up. To do this, you'll have to use longer screws to mount the upper shock tower.

Finally, I softened the front bumper, since the stock bumper has very little "give." I used a No. 3 drill bit to put some holes in it near the nose and on the sides, then I switched to a No. 29 bit to make some holes along the ribbing and under the nose. I formed two slots by cutting out about $^3/_8$ to $^1/_2$ inch of the bumper's reinforcing ribbing along the front of the nose, and this seemed to do the trick.

These simple, inexpensive modifications should strengthen the weak spots in the Striker/Sonic Fighter chassis without adding too much weight, and since these cars aren't designed for world-class competition, the extra weight shouldn't make any difference. More important, a chassis that stays together gives the beginner more time to sharpen his driving skills for serious competition in the future.

**Here's the address of the company mentioned in this article:*
***MRC/Tamiya,** 200 Carter Drive, Edison, NJ 08817.* ■

The True Facts About R/C Car Gears



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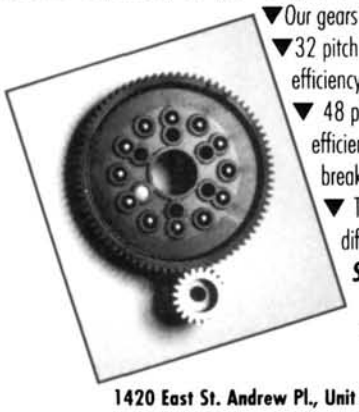

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CLOD BUSTER

(Continued from page 108)

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Race Prep, *20115 Nordhoff St., Chatsworth, CA, 91311.*
Futaba Industries, *555 W. Victoria St., Compton, CA, 90220.*
ESP Manufacturing, *524 Woodland Dr., Crystal Lake, IL 60014.*
Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
Robinson Racing Products, *501 Peach, Santa Ana, CA 92704.*
Motion Graphics, *P.O. Box 1590, Westminster, MD 21157.*
BoLINK R/C Cars, Inc., *420 Hosea Rd., Lawrenceville, GA 30245.*
Sees Precision Machine Works, *1414 W. 134th St., Gardena, CA 90249.* ■

QUICKSILVER PULLER

(Continued from page 51)

and to provide traction, I use Marui* Big Bear tires mounted on Pro-Line* chrome wheels and fitted with handmade axle-hub adapters. The rear tires have been stuffed with 3/4-inch-thick, medium-density foam. This allows the side walls to wrinkle, but keeps the tread flat on the ground. The Quicksilver took three months to complete and cost more than $700. However,

(Continued on page 130)

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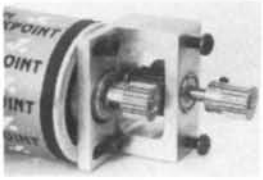

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QUICKSILVER PULLER

(Continued from page 128)

the money and time invested paid off with a 1st-place win at the 1988 Weak Signals R/C Expo in Toledo, OH.

**Here are the addresses of the companies mentioned in this article:*
MRC/Tamiya, *200 Carter Dr., Box 267, Edison, NJ 08818.*
Kyohso, *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
Black Magic, *distributed by R/C Research Engineering, 823 Ricket Rd., Unit 15, Brighton, MI 48116.*
RAm Electronics, *4736 N. Milwaukee Ave., Chicago, IL 60630.*
Testor Corporation, *620 Buckbee St., Rockford, IL 61101.*
Futaba Industries, *555 W. Victoria St., Compton, CA 90220.*
CRP (Custom Racing Products), *3250 El Camino Real B-3, Atascadero, CA 93422.*
Marui, *distributed by Model Expo, Inc., 23 Just Rd., Fairfield, NJ 07007.*
Pro-Line USA, *P.O. Box 456, Beaumont, CA 92223.* ■

RACER'S EDGE

(Continued from page 58)

sional organization. A crew from the J.M.R.C.A. (Japan Model Race Car Association) ran the races and handled all the equipment. From the word "go" these people were very professional: They knew their jobs thoroughly, cared about how

(Continued on page 133)

REEDY Modifieds

(Graph shown represents actual computer readout of Reedy Modifieds motor.)

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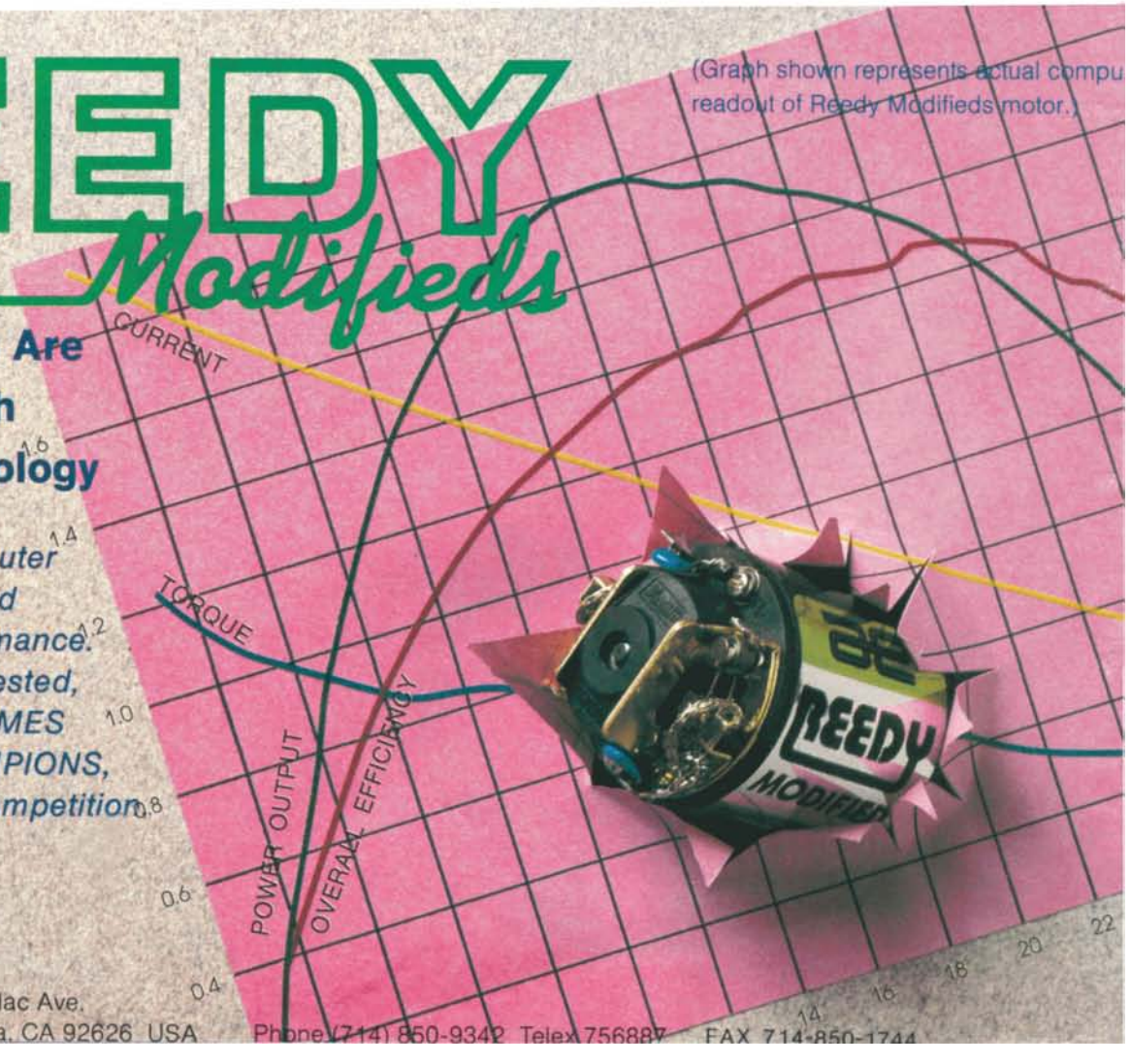

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RACER'S EDGE

(Continued from page 130)

races were run and knew what to do when there was a problem. They used an AMB lap counter, and all the Mains were figured out on a computer. In the morning, names and numbers were entered into the computer, and after each heat, the laps and times were added. These races were run faster and more efficiently than any I've ever been to, and I found myself wishing that some of the ROAR officials could have been there to see how a race and an organization is *supposed* to be run!

Permanent track facilities are another great benefit that the Japanese enjoy. Kyosho has a great track site, Tamiya has two beautiful tracks, and there are about three other tracks that I know we'd love to have in the U.S. I visited one track that was in the middle of a recreational park. Although the road to the track was bumpy and winding, the journey was well worth it. The track itself was a great 1/8-scale gas circuit, but the drivers' stand and pits needed some work.

The Japanese still lag behind us in some aspects of car design, but this will probably change *very* soon. However, as far as the quality of the races and the organiza-

(Continued on page 135)

RACER'S EDGE

(Continued from page 133)

tion goes, we Americans have a *long* way to go!

Good luck and good racing!

**Here are the addresses of the companies mentioned in this article:*
Kyosho; *distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*
Tamiya/MRC, *200 Carter Dr., P.O.Box 267, Edison, NJ 08818.* ■

JR-X2

(Continued from page 63)

bumper in the kit, so it would be a good idea to invest in one of the after-market bumpers already available. I eventually installed one made by JG Manufacturing*.

Gil Losi Jr., author of the tuning tips in the instructions, suggests dialing-in 1 degree of toe-out instead of the usual toe-in found on most other cars. Since I think Losi knows this car better than I do, I followed his directions. I also dialed-in 1 degree of negative camber on the front wheels, and these settings have proven to be right on the money.

Next, the shocks (in bag E), which are a real pleasure to assemble. The so-called

(Continued on page 139)

WALLINGFORD INDOOR RACING ASSOCIATION

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JR-X2

(Continued from page 135)

"shock cartridges" contain pre-installed O-rings, making assembly quick and easy.

The nylon pistons must be removed from their "parts tree," preferably with small wire cutters. Check the pistons carefully for any flash, and, if necessary, trim as needed with an X-Acto blade before installing them on the piston shafts. When the pistons have been mounted on their shafts and inserted into the shock cartridges, the shocks are filled with the Losi synthetic 20WT oil supplied with the kit. Fill the shocks up to the threads inside the shock body, then screw on the cartridges all the way allowing the excess oil to spill out of the ends. This can be messy, so have a rag handy. Loading the shock properly is a little tricky, as you might have to remove and re-insert the cartridge several times to get the right amount of oil into them. Too much oil will hydraulically "lock" the shock, and too little oil makes the shock mushy and ineffective.

When I screwed the front shock shafts into the bottom ball mounts, the hole in the mount wasn't deep enough to screw the shaft in all the way and this left about half of its threads exposed. Both shafts subsequently stripped out during practice, and I eventually drilled-out both mounts slightly and re-inserted the shafts so that the threads weren't exposed. This held adequately until I installed new mounts.

The bottoms of the rear shocks are mounted to the bottom trailing links via small "shoulder" screws installed from inside the car. The text is clear about this, but two diagrams show this screw being installed in the *opposite* way, so refer to the correction sheet for help.

Bag F contains the one-piece wheels and "real" rubber tires (ribbed grooves up front and spiked on the rear). Mounting the rubber couldn't be easier, as you simply pull the tires onto the rims and seat them into place. There's no mention of gluing them on, but if you intend to race this car, you'd be wise to do so. Seat the tire properly on the rim and run a small bead of a slow-setting CA (I used Pic Stic Medium) evenly between the rubber and the rims. When everything is satisfactorily in place, spray the glue with Zip Kicker to set it instantly.

Inner and outer bearings are then installed on the front wheels, and all four wheels are mounted to the car with self-locking nylon nuts. "Snug" the front nuts against the bearings, then back them off until the wheels spin freely.

Bag G is the final one, and it contains

(Continued on page 148)

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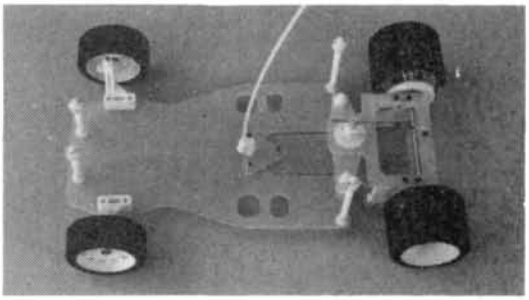

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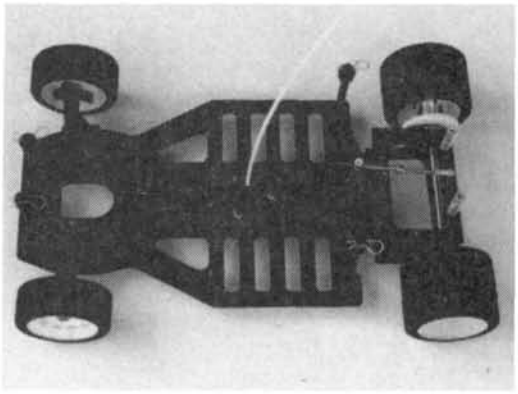

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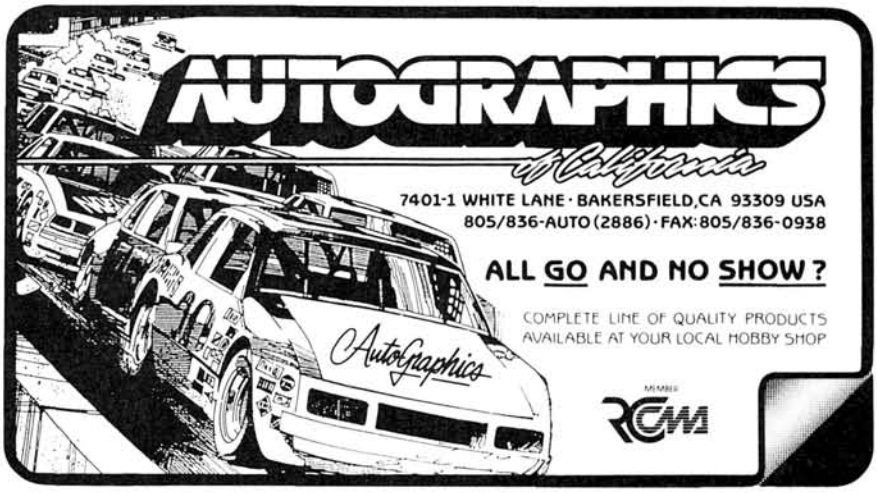

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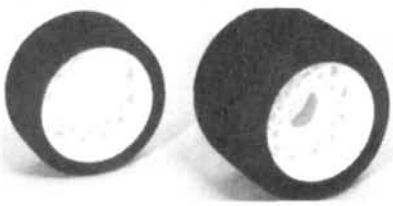
The Defiant features fully adjustable, four-wheel independent suspension; a hand-laid, two-piece fiberglass body designed for easy removal; fully adjustable, oil-filled shocks; a powerful Zenoah 23cc gas-powered engine; and adjustable ride height and spring tension.

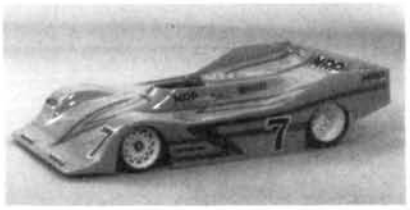
For more information, contact Race-tech, Inc., 103 Louden St. SW, Leesburg, VA 22075.



TWINN-K
BBS Wheels and Tires

Twinn-K has just introduced its new BBS wheels and tires for on-road racing. The front tires are 1.25 inches wide, and the rear tires are 2 inches wide. They're mounted and trued so that you can simply attach them to your 1/10-scale on-road racer and expect top-notch performance. Both front and rear tires are available in green and blue compounds.

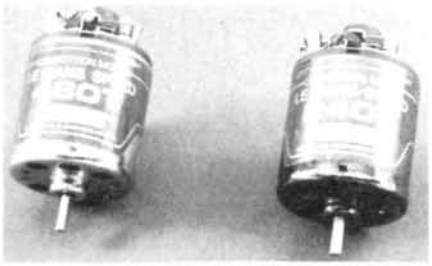
For more information, contact Twinn-K, Inc., P.O. Box 31228, Indianapolis, IN 46231.



MRP
Spyder Body

MRP has again expanded its 1/10-scale on-road body line; this time, with the introduction of the Spyder Sports Racer. For years, the Spyder body has been MRP's top-selling body for 1/8-scale pan cars, and this 1/10-scale edition should do just as well on current state-of-the-art 1/10-scale on-road cars. The low nose makes the body very "slippery" and gives great handling characteristics.

For more information, contact Model Racing Products, 18676 142nd Ave. NE, Woodinville, WA 98072.



KYOSHO
LeMans Motors

Serious 1/12-scale drivers will get the most from their on-road racing machines when they install the high-powered Kyosho LeMans 480T Speed Motor. Using wet-process ferrite magnets for greater output, durability and heat resistance, the 480T Speed is a killer motor for 8-minute races.

Also available is the 240T Speed Motor designed for the highest performance in 1/10-scale, 4-minute sprint races. This 16-turn single-wind motor is ideally suited to very winding tracks. The wet-process ferrite magnets deliver 29,100rpm and a higher output than dry-magnet motors.

For more information, contact Great Planes Model Disrtibutors, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61820.

PARMA
On-Road Tires

Parma's newest 1/10-scale on-road accessories include front "green" rubber tires mounted and ready to run on Parma's new lightweight racing wheels.

For more information, contact Parma International, 13927 Progress Pkwy., North Royalton, OH 44133.

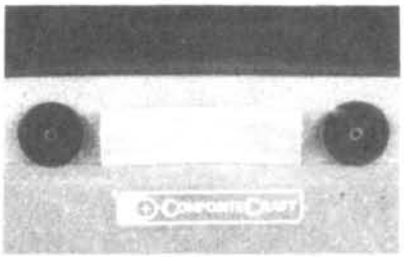
B&B SOFTWARE
Autoscore

B&B Software is proud to introduce a complete line of race-scoring and management programs for the IBM PC and other compatible systems. The Auto score programs can be used for 1/12-, 1/10- and 1/8-scale formats, and they can be used to manage races from the sign-ups to the final results. The scores of just a few racers or a complete national event can be stored, and Mains are set up in minutes. Complete race information is continuously displayed on the computer screen, including entrants' positions, number of laps, lap times and lap speeds.

The Autoscore 1/4-Score is the 1/4-scale version that includes bump-ups for the Mains as well as correcting laps under a yellow flag. The interface card allows the program to receive input directly from an AMB autocount system, so eliminating the manual input of car numbers during the race.

For more information, contact B&B Software, 2146 Palomar Ave., Ventura, CA 93001.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Radio Control Car Action,** nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Radio Control Car Action.**



COMPOSITE CRAFT Teflon Tape & Graphite Dampener Washers

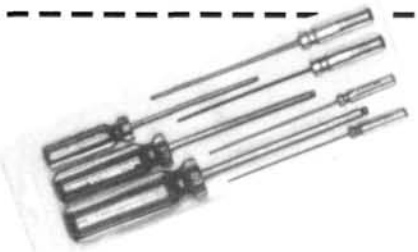
If you're running a 1/12- or 1/10-scale car, such as the 12L or the Predator, and using a dampener for rear suspension, then the Composite Craft graphite dampener washers and Teflon plate tape are for you. These graphite washers and Teflon tape provide two very smooth surfaces that eliminate the need for sticky, dirt-collecting lubricants.

For more information, contact Composite Craft, 2400 Sand Lake Rd., Orlando, FL 32809.

MCALLISTER RACING Outlaw Parts

McAllister Racing now has a complete line of replacement parts for the Outlaw 1/10-scale pavement car as well as a few lightweight performance parts. Distributed nationally, the Outlaw kit and full line of parts are all immediately available, and you can always buy McAllister Racing parts with confidence.

For more information, contact McAllister Racing, 2205 First St., Unit 107, Simi Valley, CA 93065.



BONDHUS TOOLS Balldriver Set

Bondhus Corporation's new Balldriver hex-driver set includes a range of small metric tools commonly required for maintenance, repair and assembly. The new set contains seven precision-sized fastening tools measuring: 1.27mm, 1.5mm, 2mm, 2.5mm, 3mm, 4mm and 5mm. Each tool's size is marked on its handle for easy identification, and the tools come in a sturdy, reusable vinyl pouch, which has a snap-lock flap for fast access, yet keeps tools securely in place.

For more information, contact Bondhus Corporation, 1400 E. Broadway, Monticello, MN 55362.

DAHM'S T-Shirts

Colorful T-shirts featuring the Warrior and Ultra racing bodies are now available from Dahm's. These original, full-action Kelly Telfer designs are printed on both the backs and the fronts of the shirts, and they're available in small, medium, large and extra-large.

For more information, contact Dahm's, P.O. Box 386, Cupertino, CA 95015.

TAMIYA Terra Scorcher

Tamiya is proud to introduce the Terra Scorcher. Although it can deliver top-notch performance, it can be handled by novice modelers.

Its strong bathtub chassis provides easy access to the radio equipment and is rigid enough to be stable. The Terra Scorcher has double-wishbone suspension, front and rear; oil-filled coil-over shocks; adjustable upper arms; stabilizer bars, front and rear; one-piece hubs and spiked tires; and 23 ball and thrust bearings to reduce friction in the transmission.

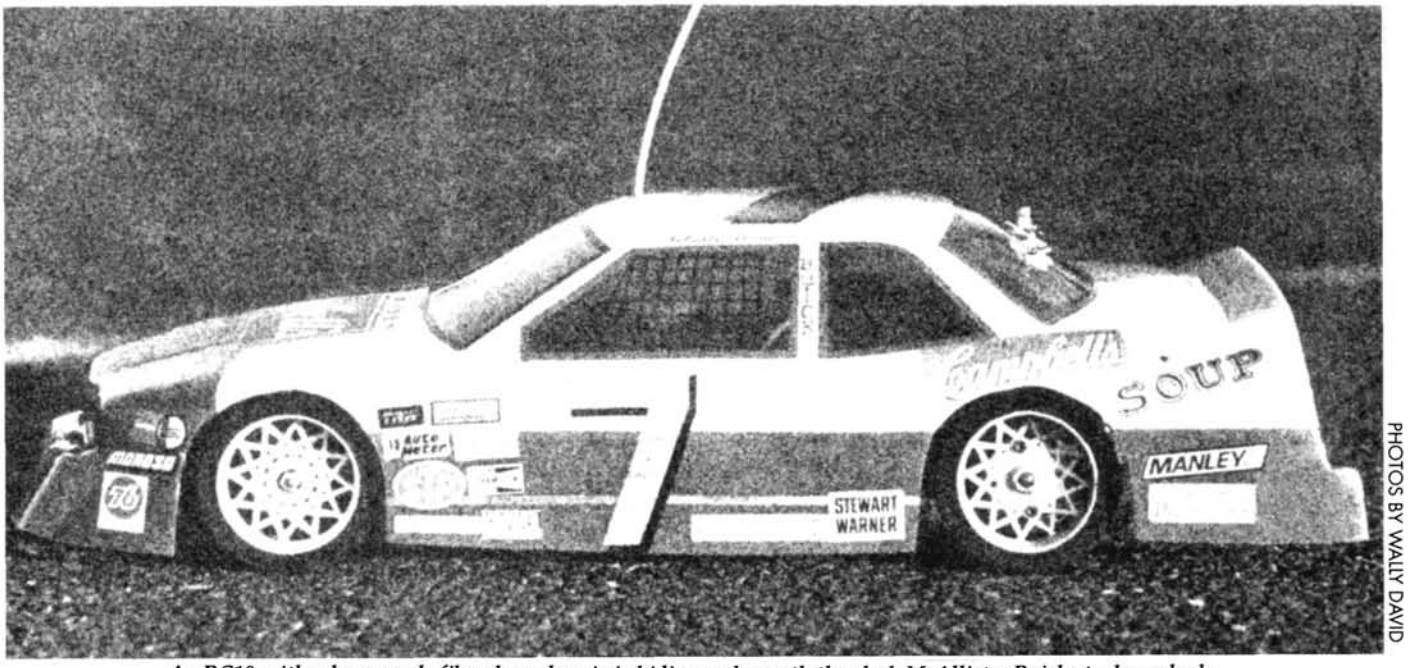
For more information, contact MRC, P.O. Box 267, Edison, NJ 08818.

BUD'S RACING PRODUCTS Horizontal Wing Mounts

For a more positive mounting system that allows easy access for maintenance, Bud's Horizontal Wing Mounts are designed to be attached to the rear shock tower of many of today's more popular off-road cars. This system may also be used in a vertical mounting position on 1/12- and 1/10-scale on-road cars.

For more information, contact Bud's Racing Products, P.O. Box 601, Amherst, OH 44001.

HOMEMADE CHASSIS



PHOTOS BY WALLY DAVID

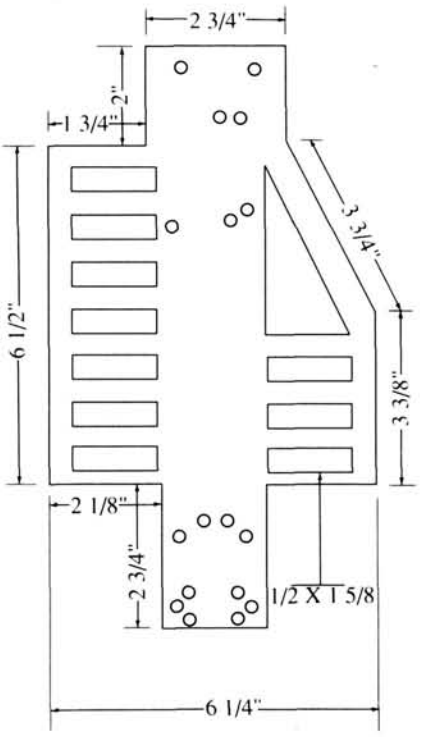
An RC10 with a homemade fiberglass chassis is hiding underneath the sleek McAllister Buick stock-car body.

MAKE YOUR OWN, SAVE MONEY... AND GO FASTER!

by WALLY DAVID

TO BORROW A PHRASE from Andy Rooney of CBS' "60 Minutes," "Did you ever notice" how expensive those custom graphite chassis are? Well, now you can have the next-best thing: You can make your own scratch-built fiberglass chassis w*ithout* paying the high-dollar price tag of graphite.

I made my first chassis about six months ago when I'd had trouble preventing my car from wandering to the right. After hours of checking the steering servo, servo saver, tie rods and everything else I could think of, looking for some unknown bend or break, I tore the car down only to find that the stock Associated* RC10 aluminum tub chassis was bent. This bend, or tweak, was the cause of the phantom steering. At this point, I decided to go the fiberglass route for the replacement chassis. I designed the chassis so that it could be used for either ovals or roadcourses, on dirt, pavement or carpet. The fiberglass used on my project is the 3/32-inch sheet sold by Parma*, which is thick enough to limit the degree of flex, but not too heavy. While I designed the chassis with the RC10 in mind, with relatively few changes, it could probably be used for other models.



Parma's 3/32-inch-thick fiberglass was used to make Wally's RC10 chassis.

First, using a ruler with a good edge, draw a full-size copy of the chassis following the measurements in my diagram. Use your stock chassis as a template for the location of the mounting holes (steering bolts, servo mounts, gearbox holes, etc.). Refer to the diagram for drill-bit sizes. You'll see that I have battery slots shown on the diagram; this is for racers who use saddle-pack-style batteries. However, because you're making *your own* chassis, you can design it to use stick packs with the stock RC10 battery boxes. Saddle packs have the advantage of allowing the batteries to sit lower, thus lowering the car's center of gravity. You can always start with stick packs and change over later.

When you've drawn the chassis, the next step is transferring it to the fiberglass, and it's best to do this by using carbon paper under your original drawing. Trace over all the lines to transfer them onto the fiberglass, and when that's done, remove

the diagram and the carbon paper. Then, with a marker, go back over the lines drawn on the chassis, as they'll probably be too light to work with.

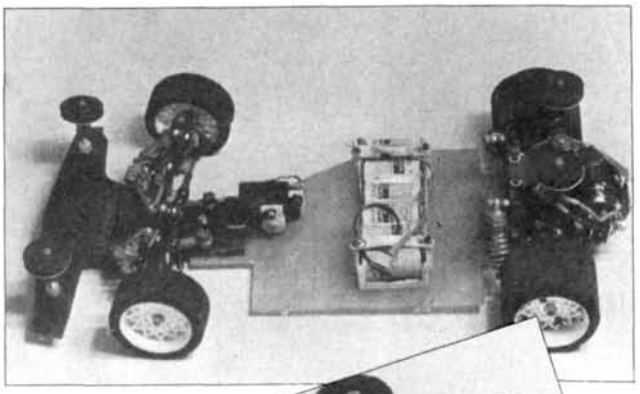
Next, cut out the chassis. I use a Dremel tool for this, as I think it's the best thing since trued-and-glued sponge tires. When I started in the hobby, I only had a couple of screwdrivers, but now, with all the different bits available for the Dremel, I think I can accomplish most R/C-related tasks. The bit I needed for this job was a cut-off wheel from Du-Bro*. This disc will cut through almost anything—including fingers!—so *be very careful*. I strongly recommend that you wear eye protection and some kind of dust-filtering mask.

The best way to cut the chassis is by clamping it onto your workbench with a few pairs of locking-type pliers or C-clamps. Be sure that the part of the chassis you're cutting is hanging over the edge of the table, or you might cut through the chassis and into your working surface. Start by scoring a shallow guiding cut along the line you transferred. The trick to using a Dremel tool is to *let the tool do the work*; very little pressure is needed. After making the initial light cut, score along the line until you've cut through the glass. Continue cutting around the chassis, repositioning the fiberglass and clamping it down as you go along until you've cut out the whole chassis. Then shape and sand the edges with a grinding bit.

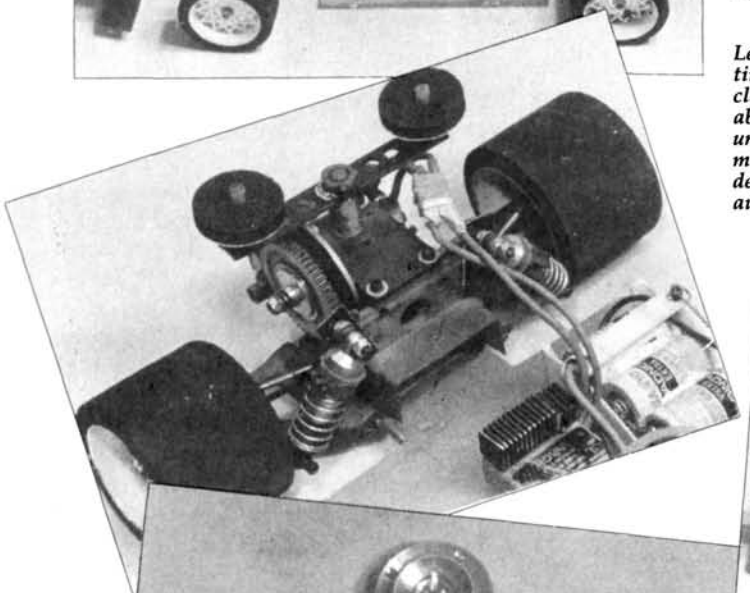
Next, drill all the holes in the positions you marked on the chassis. Remember to countersink these so that the screws are flush against the bottom of the chassis. A cone-shaped grinding bit was used to shape the holes. To get an idea of how they should look, refer to the stock tub.

Now on to the battery slots. (Even if you *don't* have saddle packs, you can read this part for future reference.) First, drill a hole in the corner of one of the slots so that the edge of the hole nearly reaches the line that you marked earlier. Now take a jewelers' saw or a small hacksaw and cut out the slot along the marked lines. I don't recommend that you use a power saw for this project unless you have a lot of experience with them, because it's very easy to ruin the chassis with one stray cut. Using a hand saw may take longer, but it's really worth the time and effort, because there's less likelihood that you'll screw up the whole project. Follow the same procedure for all the slots. When they've all been cut out, use the cone-shaped bit to enlarge the slots until your batteries are seated snugly. The further down you can get the cells into the slots, the lower the center of gravity will be. Follow the same procedure for cutting out the triangular-shaped area on the right, front side of the chassis. This area is just extra weight, and removing it won't weaken the chassis.

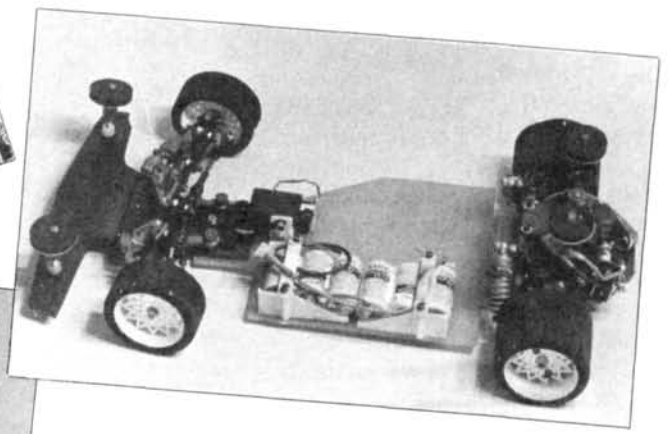
(Continued on page 172)



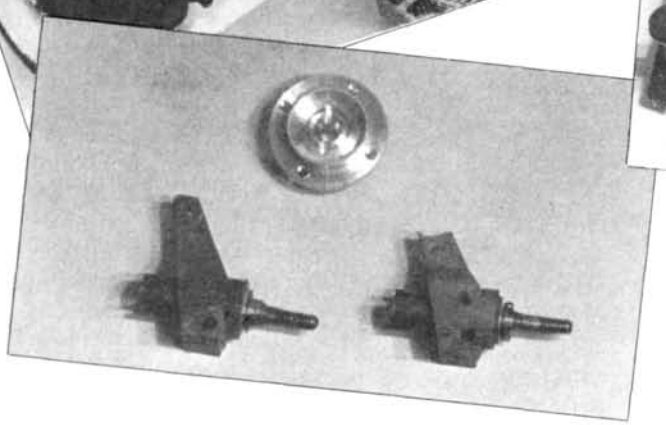
Left: It 's easy to change the mounting location for stick-type battery packs. Here, the car is set up for road racing.



Left Center: The TRC tires don't leave much clearance for the shock absorbers. Notice the unique, rear, body-mount system described by the author.



Above: Here the chassis is set up to use stick packs offset for oval-track racing.



Left: A comparison of the stock rear hub carrier (left) and the modified carrier (right) shows the top cut off and a new hole drilled for the upper control rod. Above the carriers is the aluminum adapter needed to mount the TRC BBS rims on the RC10.

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JR-X2

(Continued from page 139)

the pre-bent wing wire and Losi's unique locking buttons to hold down the wing. Also included is a nifty antenna mount that locks and unlocks and is capped off with a neat antenna cap.

After being undercoated with Parma Indy Silver, the body was finished in Pactra* Metallic Burgundy, and blended orange and yellow stripes were applied with spray paint. I used Parma* Liquid Mask for the windows and vinyl automotive pin-striping tape for the stripes.

The car was fitted with an Airtronics* XL2P radio system with a Novak* NESC-1 speed control. A Trinity* Monster Horsepower stock motor was fitted with the recommended 24-tooth (48 pitch) pinion gear and meshed to the supplied 82-tooth spur gear. A Sanyo* 6-cell SC pack was charged up, and then we were off to the local racetrack to shake out the bugs.

PERFORMANCE: Before getting too crazy with the car, adjust the diff. The "tuning tips" point out how important this is and detail the proper procedure for doing it. Basically, the diff must be adjusted a little at a time.

(Continued on page 150)

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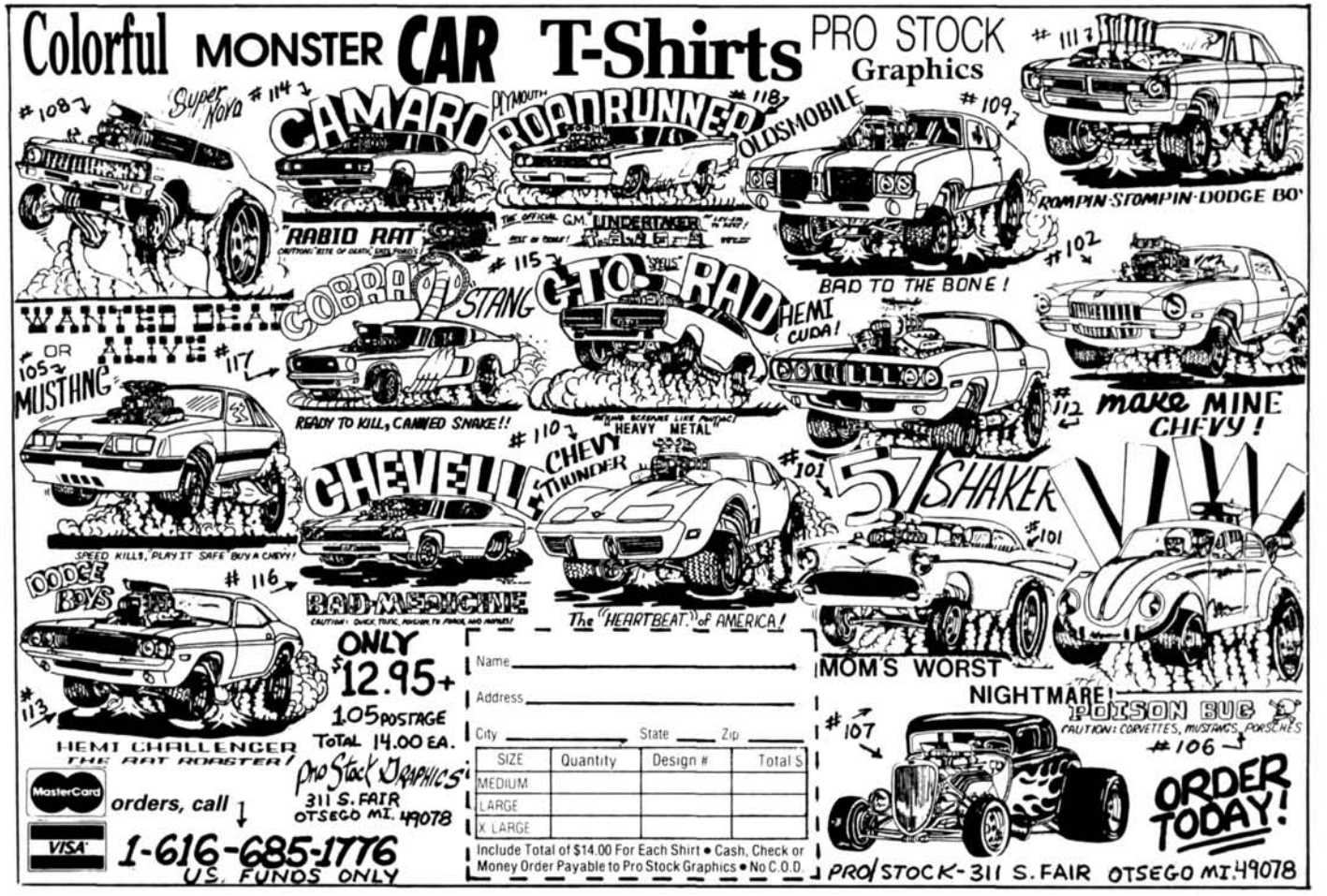

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JR-X2

(Continued from page 148)

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Owing to its low-output-ratio transmission, the car is a rocket off the starting line, and the Losi 5-Link rear suspension allows it to float in a straight line over the rough stuff. The car has a tendency to nose-dive over tall jumps, and some further suspension tuning may be needed to alleviate this problem. I subsequently fitted a Team Hammer* multi-element racing wing, and it did help slightly; at least, when the car was running at high speeds.

This kit was assembled on a Wednesday and, the following Saturday, entered in a race at Brake-A-Way Raceway, in

(Continued on page 152)

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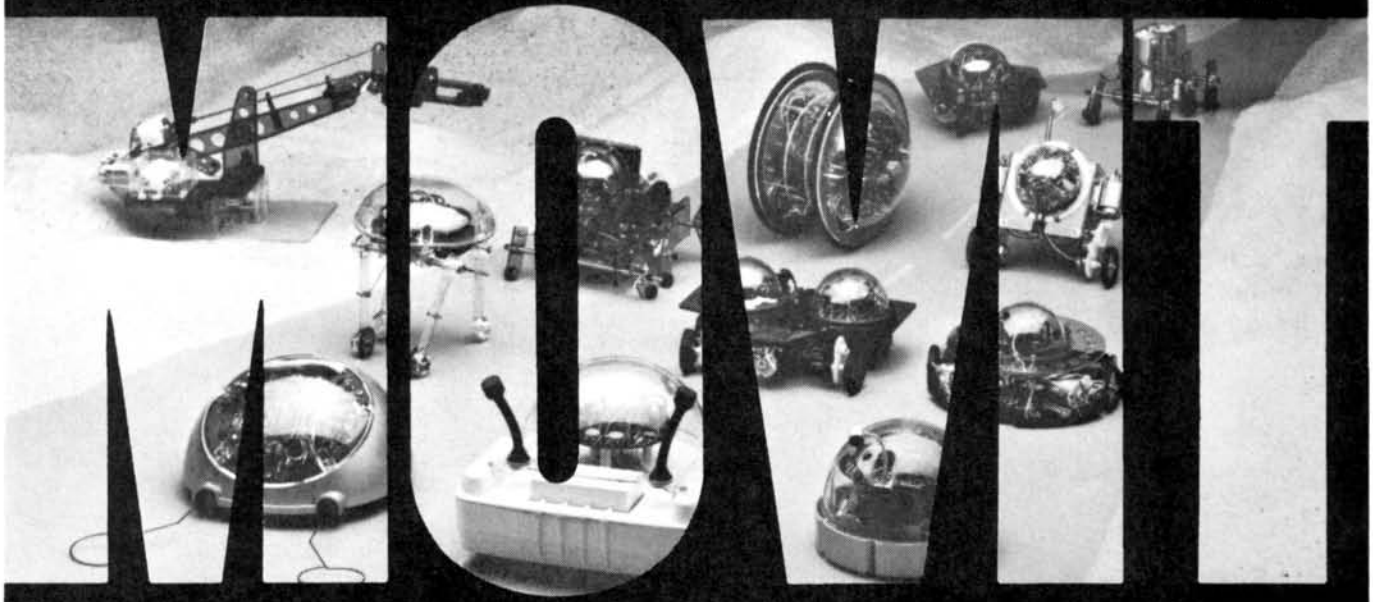

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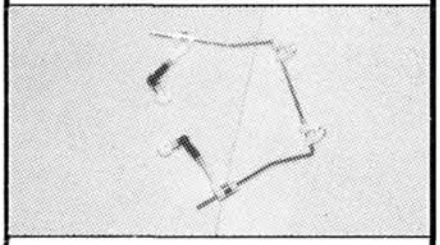

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JR-X2

(Continued from page 150)

Norco, CA, where it TQ'd and took 1st place in 2WD Stock. The following weekend, at Brake-A-Way's "Toys For Tots" Christmas race, the JR-X2 was the third-fastest qualifier and again took 1st place in the 2WD Stock A-main, so earning me a 17-pound frozen turkey! It also took 2nd place in Concours at the same event. Not bad, for an out-of-the-box car!

After running a couple of battery packs through the car, I noticed stress cracks around the front wheel hubs and at the ends of all the spokes. As mentioned earlier, the front, bottom, shock mounts stripped out and had to be attended to. During a subsequent race, the front bulkhead self-destructed and had to be replaced. Gil Losi Sr. recently explained that all these early problems have been addressed, and the newer kits contain the *improved* parts.

So will the new JR-X2 become the next 2WD Off-Road World Champion, or will it prove to be just another pretty face? Well, only time will tell, but this car is *definitely* headed toward Australia, right out of the box!

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(Continued on page 154)

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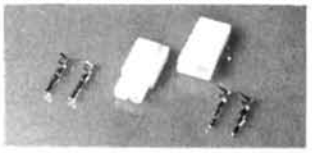

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(Continued from page 152)

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DIRT DIGEST

(Continued from page 65)

What does all of this have to do with Blackfoot wheels? Well, those wheels have *extreme* positive offset, so they place most of the wheel weight on the axle. With a conversion kit you typically need to add a wheel adapter to match your current hub to the Blackfoot wheel pattern. A wheel adapter doesn't change the offset of a wheel, but it does move the entire wheel and tire farther to the outboard side (Fig. 3) and, with a Blackfoot wheel, that puts

(Continued on page 156)

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DIRT DIGEST

(Continued from page 154)

an incredible amount of stress on the wheel bushing.

Of course, they probably won't deteriorate in a day, or a week, or even a month (well, maybe plastic bushings would), but you're guaranteed to reduce their life by 50 percent or more. And don't think you can switch to stainless steel ball bearings and get around the problem—you can't. While the bearings will last longer than the bushings, they'll often take the wheel shaft with them when they go. Personally, I don't like high-maintenance vehicles; I'd rather spend my time *running* my cars and trucks than *fixing* them.

In this case, the solution is really simple: To make the best use of the conversion kit, a wheel with less positive offset is needed. The complication is that it has to have a Blackfoot mounting pattern. That's why we're here. Polk's Model Hobbies* solved this problem with its Aristo-Craft Wildebeest wheels (stock No.1955) that have approximately 5/16-inch positive offset (compared to the Blackfoot's approximately 9/16-inch wheels) Better still, they use the Blackfoot mounting pattern. With this particular conversion (an Optima Mid), we ran into a problem with the wheel's center hole, which was a little too small for the supplied adapter lug. It took about 2 minutes of careful work with a small round file to remedy that. Once mounted, the result was a wheel that had nearly the same mounting position and offset as the original (Fig. 4), even with the adapter installed.

Is any conversion kit worse than any other? No. Any kit that offers a wheel adapter (they all do) will cause a problem eventually. The ideal solution is to find a wheel with no offset or even some negative offset (Fig. 5) to duplicate the original wheel position as closely as possible but, short of custom wheel makers, an exact match won't usually be possible. Is the problem limited to truck conversion? No, again. Apart from those using wheels with blank hubs and insert adapters like TRC's*, any wheel conversion that pushes your wheel out along the axle will eventually cause difficulties, whether it's on a truck or on a car, and regardless of scale. At least, now you know what can be done about it.

Another month shot down in the dirt.

(Continued on page 158)

TMS prödücts

...Margaret
Showing off her TMS-modified Clod Buster featuring these TMS Products: Clod Buster Spiked Tires, Centerline Aluminum Wheels, and American R/C "Chevy Dually Crew Cab."

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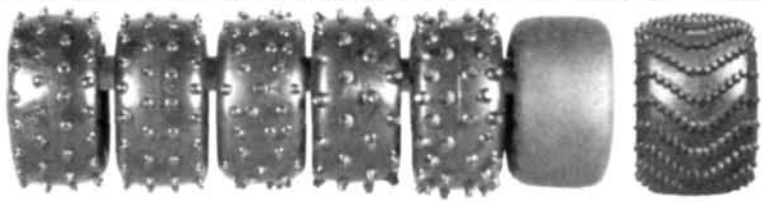

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DIRT DIGEST

(Continued from page 156)

Next time, we'll look at some Clod Buster problems. Yes, I've heard from you crashing, thrashing folk out there and you keep breaking your chassis. And no, it doesn't *have* to be that way. Likewise, the MRC/Tamiya Thundershot could use a dose of simplicity at the motor-mounting plate. Its design makes it a real pain to get the motor out. And if you happen to own a Kyosho* Burns, you'll get to see what could be in store for your spur gear (it's not pretty) if you get careless. Until then, write in to share your thoughts with everyone, or no one will share theirs with you.

**Here are the addresses of the companies mentioned in this article:*
MRC/Tamiya, *200 Carter St., P.O. Box 267, Edison, NJ 08818.*
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BUDGET RACER

(Continued from page 68)

surprisingly strong.

So what's next for the Raider? Obviously, with some work on the handling,

(Continued on page 164)

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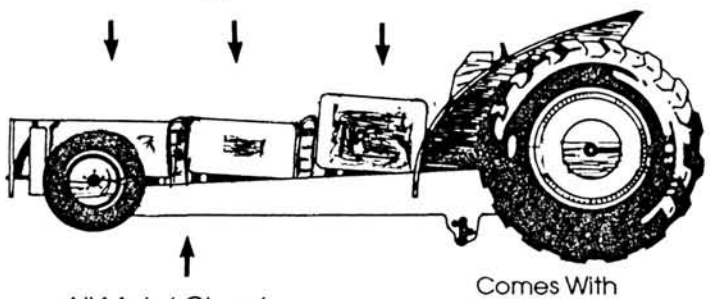

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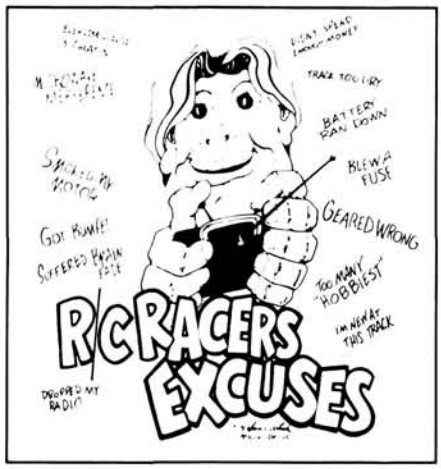

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BUDGET RACER

(Continued from page 158)

this car is a real threat in Production Class, and that's what I'm going to do. I'll work on the Raider and publish the results so that anyone can run this car in Production Class and know he has a competitive racer. Even if you don't have a Raider, stick around; the "hows and whys" apply to all cars.

Coming up: I have a set of mini Gold Kyosho shocks (dampers) to try, then Kyosho's Platinum or perhaps Associated's* RC10 shocks. I also have some springs that should help a lot with the oversteering problem. I'll see what effect low-profile tires have on fast lap times—a lot, I bet. In short, I'll get the suspension dialed-in and go racing! I'll also spec out Scott Hightower's car.

See you at the track!

**Here are the addresses of the companies mentioned in this article:*

***Kyosho**; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.*

***Pacer Technology & Research**, 1600 Dell Ave., Campbell, CA 90302.*

***Parma International Inc.**, 13927 Progress Pkwy., North Royalton, OH 44133.*

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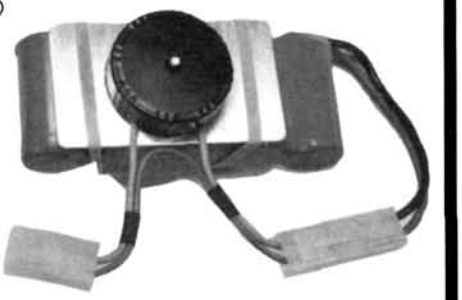

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TROUBLESHOOTING

(Continued from page 70)

wheel wobble, which is always worse with larger tires.

The speed control on the Lunch Box is the reliable Tamiya three-step unit, but it must be serviced regularly to keep it in top condition. The kit includes a switch lubricant that should be used when assembling the truck and each time you clean the speed-control contacts. At least once a week, clean the contacts on your speed control by simply wiping off the dirt and the old switch lube. The contact surface might not look dirty, but dirt builds up just as a result of the speed control's wiper action. To do a really thorough job of cleaning the contact surfaces, you could rub them with a piece of fine emery cloth. To ensure good electricity flow and smooth wiper action, and to prolong the life of your speed control, apply a small amount of clean switch lube.

By always giving your truck a good once-over after running it, you might avoid major problems. Cleaning and checking your truck's components after each run allows you to detect and solve minor problems before they become major time-consuming expenses. Remember, most maintenance problems have quite simple solutions, but early detection is important. Finally, when troubleshooting on your R/C vehicle, always look at the basic components first. Don't tear your car apart, only to find that you have a poorly charged battery pack! Good luck and happy motoring!

*Here are the addresses of the companies mentioned in this article:
MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.
Miracle Speedway, 300 Pheasant Dr., Kalispell, MT 59901.
Trinity, 1901 E. Linden Ave., #20, Linden, NJ 07036. ■

BIG GRIZZLY

(Continued from page 80)

letters on the tailgate decal will show up.

The auxiliary running lights, roll bar, and side mirrors are of injection-molded plastic. Varicom could gain several appearance points by chrome-plating these lights instead of leaving them plain, white plastic. Although the instructions don't mention it, using washers between the screws and body when attaching the roll bar and side mirrors may prevent the screw heads from popping through the body in the event of an endo.

The antenna rod mounts on the left side of the battery compartment. The instruc-

(Continued on page 168)

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BIG GRIZZLY

(Continued from page 166)

tions suggest simply wrapping the antenna wire from your radio receiver around this rod and tying the wire to the end of it. This is a rather unorthodox location for an antenna, and it isn't a very good method for securing the wire, either, as the antenna wire could easily get snagged. It would be safer to relocate the rod *inside* the chassis and run it *through* the body. You might also want to snip off all but a few inches of the rod and encase it and the antenna wire with an antenna tube (available at your hobby shop).

The Grizzly's weak spots appear to be in the front suspension and drive train. When the front end encounters a bump, the suspension exhibits a drastic change in camber, although some of this can be dialed-out by adjusting the rods atop the wheel uprights. The center spur gears are prone to break, especially when using a hotter-than-stock motor or battery pack. If the rear differential assembly isn't kept buttoned down tightly, the gears tend to slip. If you maintain the proper pinion-to-drive-gear alignment, frequently relubricate all moving parts, and avoid nailing it from a dead stop, you'll have fewer prob-

(Continued on page 170)

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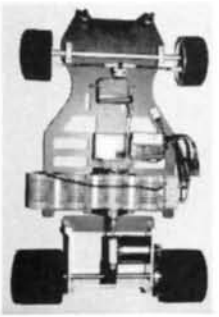

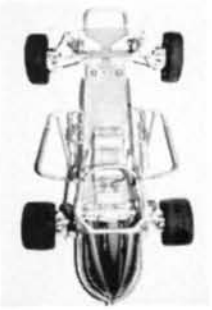

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BIG GRIZZLY

(Continued from page 168)

lems. As is usual for most kits, a complete set of ball bearings would be a good investment in the long run.

The Big Grizzly would be a good choice for someone looking for a 4WD monster truck that's relatively inexpensive to purchase and maintain. Since it's more complex than a 2WD truck and requires more maintenance, prospective buyers should have at least some R/C experience. When properly set up, watch out: This mammoth will flatten anything that gets in its way!

**Here are the addresses of the companies mentioned in this article:*
Varicom; *distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley CA 92728.*
MRC/Tamiya, *P.O. Box 267, Edison, NJ 08818.*■

SCOPING OUT

(Continued from page 84)

the instruction manual. This manual gives no indication how to wire the speed controller into your car, and only a slight hint about how to adjust the rate and neutral pots. Dialed Racing uses about half of the instruction manual to explain why they selected the FETs they use in their output circuitry. In essence, they're trying to justify their overstated current capability. Having used all this space on the selection of FETs, nowhere does DRP tell you the minimum or maximum number of cells the unit is capable of accepting. Another problem with the DRP-306 is that there's no indicator to show whether the BEC switch is on or off. This problem isn't unique to the DRP-306, as several other controllers have the same problem. The final problem, again one not unique to the DRP-306, is the access and adjustment of both the neutral and rate pots. You'd expect that to increase the speed or neutral adjustment, you'd turn the pots clockwise, but with this controller, you have to turn them counterclockwise. As stated earlier in this article, the access to the rate and neutral pots is difficult and requires the use of an insulated screwdriver.

The dimensions of the ruggedly constructed 306 make it small enough for 1/12 scale. During much race testing and at least two dozen high-speed crashes, controlled by the hand of a fledgling road-racer, the DRP-306 speed controller never faltered. The instruction book *does* need improvement, but our field tests indicate that Dialed Racing Products produces equipment in which you can have confidence.

(Continued on page 172)

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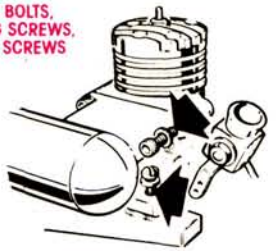

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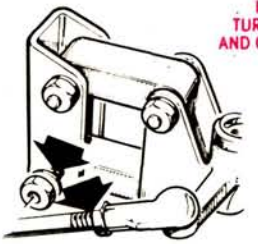

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SCOPING OUT

(Continued from page 170)

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Futaba Industries, *555 W. Victoria St, Compton, CA 90220.*
Airtronics, Inc., *11 Autry, Irvine, CA 92718.*
KO Propo, *distributed by Global Hobby, 10725 Ellis Ave., Fountain Valley, CA 92728.* ■

HOMEMADE CHASSIS

(Continued from page 144)

You can now remount the front and rear suspension, the gearbox, the battery boxes (if used) and the radio gear. In the photos, you'll see that the stock nose plate has been replaced with a graphite piece from Composite Craft*. This nose plate is stronger and lighter than the stock one, and, since it doesn't require any nose-brace tubes, it's much easier to use than the stock plate. Without any braces, the stock plate will bend upwards in a crash, and to use it, you have to make some sort of blocks on which to bolt the nose-brace tubes. I strongly recommend that you use the graphite one instead.

I used the new TRC adapters to mount their 2-inch BBS wheels and tires onto my RC10. Some modifications were needed to allow the rear width to remain within the ROAR maximum of 9.875 inches. You'll have to cut the top off the rear hub carrier to just below the hole for the upper control arm, then drill a new hole in the hub carrier. The next step is moving the bottom of the rear shock to one of the inside holes. When using Andy's* A-arms, as I have, you'll have to use the hole that's closest to the gearbox. Now mount the tire backwards onto the adapter, i.e., have most of the wheel facing inwards toward the gearbox. By cutting the rear hub carrier and repositioning the shock, you'll be able to run these extra-wide tires and remain legal. Of course, you can use the new chassis without the wide tires, but I think the wide tires work well and look neat.

I've done some other things to my car that you might consider worth trying. I made my own body mounts from scratch. To make a front bumper/body mount, I bought a piece of Kydex from Trinity*, cut it with my Dremel tool (I *told* you I can do *anything* with it!) and bent it to the proper angle over the stove burner. Then I simply drilled a couple of holes for the body posts. The rear mount was made using a piece of graphite chassis stiffener. I drilled a hole in the center of the stiffener to fit over the stock body post, and

(Continued on page 174)

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HOMEMADE CHASSIS

(Continued from page 172)

secured it with a locking collar. A hole was drilled at each end to attach the new body mounts, and additional holes were drilled to lighten the graphite. The body mounts were topped off with body pads made by Custom Works* for use on the Dominator. They'll work well on *your* "dominator," too.

Finally, no matter how much you've modified your RC10, I wouldn't race it without the Team Losi* Ball Bearing Bellcrank for the front steering, and the Parma Super Heavy Duty Tie Rod Kit. These two items will bulletproof your car.

I hope that you find these suggestions helpful. They're race-proven and fun, and most of us enjoy making things ourselves—especially when we can save some money at the same time.

I took my reworked RC10 to Henning Scale Models Raceway in Lansdale, PA, and had great success there. This is an indoor carpeted track set up in a roadcourse configuration with a 65-foot straightaway leading to a 90-degree right-hand turn. That turn leads into a series of difficult S-turns followed by a sweeping right-hander that puts you back onto the main straight. The tires didn't even need tire-traction treatment—just a little rubbing alcohol to clean them. After being the top qualifier in each round and winning both of my heats, I was able to squeak out a win in a fierce battle against Joe Grawe, one of the best racers in the area. I raised more than a few eyebrows with my new fiberglass chassis RC10 setup, and so will you!

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TRACK DIRECTORY

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to **R/C Car Action Track Directory,** 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

(Continued on page 176)

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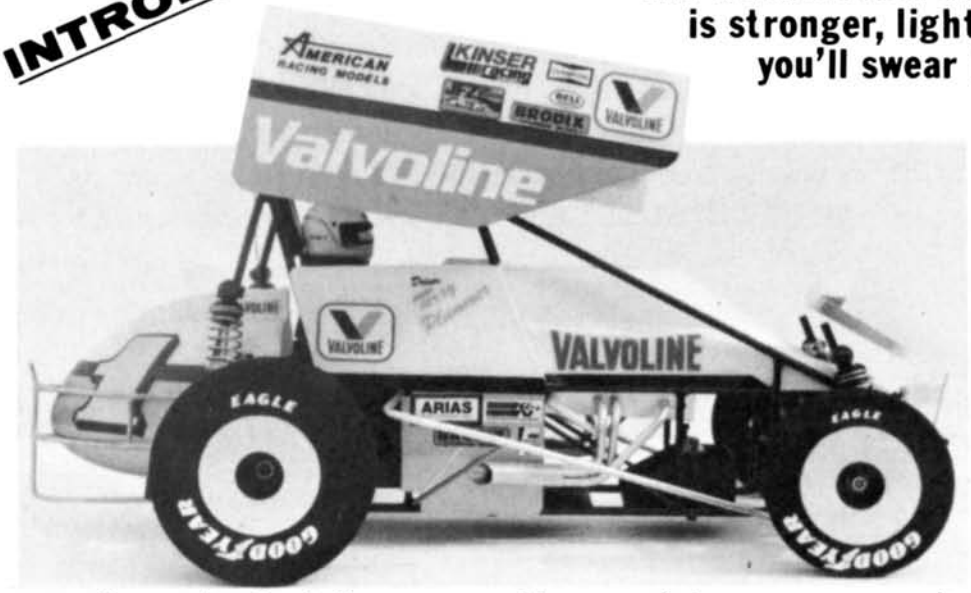

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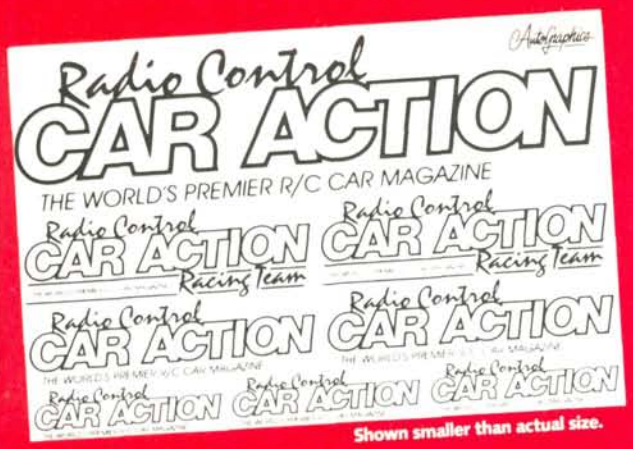

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